

Medical Sciences Campus

# "Reforma de Salud, Educación y Servicios de Salud a Distancia":

*Retos y Evolución para los  
Centros de Salud Académicos  
en la Nueva Década*



**XXII** || **F O R O D E**  
**INVESTIGACIÓN**

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## Sección A

**A-1** **Novel Mechanism for Anabolic Steroid Actions in the Brain.** Juan Carlos Jorge<sup>1</sup>, Kerry McIntyre<sup>2</sup>, and Leslie P. Henderson<sup>3</sup>. Department of <sup>1</sup>Anatomy, Medical Sciences Campus, University of Puerto Rico, P.R. 00936. Departments of <sup>2</sup>Biochemistry and <sup>3</sup>Physiology, Dartmouth Medical School, Hanover-NH 03755.

Anabolic androgenic steroids (AAS) have become a major class of drugs of abuse worldwide. Despite their deleterious effects in reproductive health, endocrine function, and affective components of behavior, little is known about their physiological effects in the CNS. We show for the first time that AAS differentially modulate (-aminobutyric acid type A (GABA<sub>A</sub>)-mediated spontaneous inhibitory postsynaptic currents (sIPSC's) in the ventromedial nucleus of the hypothalamus (VMN) and the medial preoptic area (mPOA) of the female rat brain; two brain regions that are critical for endocrine and reproductive functions. We found that 1:M 17"-methyltestosterone, stanazolol, and nandrolone potentiated sIPSC peak amplitude in the VMN, whereas sIPSC peak amplitude is decreased in the mPOA. The preferential expression of the (2 subunit in the VMN versus (1 subunit in the mPOA confers region-specific effects of AAS on GABAergic neurotransmission as shown with ultrafast application of GABA plus AAS to chronically isolated neurons from these brain regions, and with transiently transfected human embryonic kidney (HEK) 293 cells. We compared AAS effects with those obtained with the androgen neuroactive metabolite 3"-DIOL. Although 3"-DIOL effects were dependent on the endocrine state of the animal, this neurosteroid potentiated sIPSC's in both the VMN and the mPOA suggesting that AAS and neurosteroids do not share a similar binding site at the GABA<sub>A</sub> receptor. We conclude that AAS can act as allosteric modulators of GABA<sub>A</sub>-R and that region-specific effects may be possible via regulation of GABA subunit expression in hormone sensitive regions of the brain. Supported by the NSF (DBI-9707828 to JCJ) and the NIH (NS28668 to LPH).

**A-2** **Ascorbic Acid and Copper: Effective Cytotoxic Agents Against Metastatic Breast Carcinoma (BRCA) Cells.** Guzmán, A., Pérez, Y., Mora, E. M., González, M. J., Miranda-Massari, J. R. Department of Surgery, UPR School of Medicine, Department of Human Development, Nutritional Program, UPR School of Public Health, and Department of Pharmacy Practice, UPR School of Pharmacy, San Juan PR.

Ascorbic Acid (AA) or Vitamin C has been proposed as a non-toxic agent against cancer due to its redox capacity. In addition, copper is known to be a co-factor in most of the metabolic reactions mediated by AA. Phase I clinical studies in terminal patients with different primary tumors had shown that administration of high doses of intravenous AA improved their quality of life and significantly prolonged survival. We hypothesize that copper enhances the killing of different human metastatic BRCA cells by AA. To test this hypothesis we exposed pleural-metastatic and bone-metastatic BRCA cells to low (0.05- 1.0 mg/ml), moderate (2.5 - 5.0 mg/ml) and high (10- 50 mg/ml) doses of AA for 24-72 hours. Cells were also exposed to a combination of AA and copper (CuSO<sub>4</sub> 10 mg/ml) to assess the interaction between copper and AA in BRCA cell growth. Cell number was determined by the MTS assay. Results were correlated with morphologic changes at all time points. Results showed that for both cellular lines: 1) high doses of AA show variable growth of metastatic BRCA cells, suggesting complex metabolic intracellular mechanisms. Addition of CuSO<sub>4</sub> did not affect the growth action of AA (p > 0.05). 2) Moderate doses of AA without CuSO<sub>4</sub> show no effect in the growth of BRCA cells. Addition of CuSO<sub>4</sub> significantly (p < 0.05) increased cell killing. 3) Low doses of AA with or without CuSO<sub>4</sub> had no net effect in the growth of metastatic BRCA cells. The only exception was the combination of AA 1.0 mg/ml and CuSO<sub>4</sub>, which induced cell killing after 48 hrs. We conclude that: 1) AA can exert a dose-dependent growth effect of metastatic BRCA cells, and 2) CuSO<sub>4</sub> enhances the killing effect at moderate doses of AA. These results suggest that AA in combination with CuSO<sub>4</sub> may be an effective

cancer therapy. These findings need further investigation at the molecular and clinical level. Supported by a grant from the Puerto Rico Cancer Center.

**A-3 3-D Comparison: Marginal Fit of PFM Vs. Pressed Porcelain Crowns.** R. Perry, N. Velazquez\*, K-H. Kunzelmann (Tufts University School of Dental Medicine, Boston, MA, USA; University of Puerto Rico, San Juan, Puerto Rico; University of Munich, Munich, Germany).

The aim of this in-vitro study was to compare the fit of porcelain fused to metal restorations versus pressed ceramic restorations using three-dimensional analysis. A standardized facial/occlusal notched shoulder-prep metal die was fabricated and 40 (forty) impressions using Impregum (ESPE) impression material were taken. The models were poured with green Die-Keen (Heraeus Kulzer) stone by one investigator. Twenty crowns were fabricated for each crown type. After fabrication of the samples the fit of each crown was tested on the master metal die by a 3-D laser digitizer. Six millimeters of the notched facial aspect was evaluated for each sample. Specimens were evaluated and the following results obtained; the mean values and 95% confidence intervals were: 99.424, 87.068 to 110.961 for pressed ceramic restorations and 84.485, 68.134 to 100.836 for porcelain fused to metal. The One-way ANOVA was not statistically significant at 0.05 level. There is no statistically significant difference for the gap distance (fit) of Empress (Ivoclar North America) and porcelain fused to metal crowns. This study was supported by grant NIH/NIDCR-DE07268.

**A-4 Eph Receptor Protein Tyrosine Kinases as Putative Inhibitory Cues after Spinal Cord Injury.** L. Cruz Orengo<sup>1</sup>, M. Irizarry<sup>1</sup>, C. Willson<sup>2</sup>, S. Whittemore<sup>2</sup> and J. Miranda<sup>1</sup>. <sup>1</sup>University of Puerto Rico School of Medicine, Department of Physiology. <sup>2</sup>University of Louisville School of Medicine, Department of Neurological Surgery, KY.

Among the molecular cues that are involved in axonal growth and synapse formation during development are the family of Eph Receptor Protein Tyrosine Kinases (RPTK). The interaction of these RPTK's with their ligands, the ephrins, has been found to be inhibitory regarding axonal outgrowth. Models of central nervous system trauma shown an increase in the repulsive environment for neurite regrowth. However, the Eph RPTK's expression,

and possible role after spinal cord injury (SCI) have not been determine. To address this possibility we have examined the expression of some Eph's after contusion SCI in Sprague-Dawley rats. Adult rats were injured at T-10 spinal cord segment using a NYU Impactor. Expression studies of Eph RPTK's and their ligands were done after 2, 4 and 7 days post-injury, by semi quantitative RT-PCR, immunohistochemistry and fusion protein assay. An increase of Eph A3 mRNA levels was observed since 2 days after injury and persists after seven days, while Eph A4 is upgraded seven days after injury. Polyclonal antibodies against these Eph's shown an increased immunoreactivity localized in the ventral region of the white matter. Also, ephrins expression using binding studies with fusion proteins shown binding enhancement following 4 days after lesion. All the previous data suggest that Eph A3 and Eph A4 may contribute to the non-permissive environment for axonal regeneration after SCI. Further investigation is needed to discriminate the upregulation expression relevance in regenerative process and if so, their putative therapeutic role. Supported by NIH (U54NS39405), partial support from NIH-NCRR (G12RR03051) NSF-EPSCOR (EPS-9474782), Kentucky Spinal and Head Injury Research Trust and UPR-School of Medicine.

**A-5 Taxol Induces Different Apoptotic Pathways in Bone- and Pleural-Metastatic Breast Carcinoma (BRCA) Cells.** Perez Y, Lopez L M, Torres M, Mora E M. Department of Surgery and Pathology, UPR School of Medicine, Medical Sciences Campus, UPR.

Taxol is one of the most effective chemotherapeutic agents against metastatic BRCA cells. Expression of different anti-apoptotic proteins, like Bcl-2 and Bcl-xl, correlate with aggressiveness of the disease and resistance to chemotherapeutic agents. Expression of Bcl-xl suggests a more aggressive phenotype when compared to expression of Bcl-2. We had previously shown that Adriamycin increases the expression of Bcl-2 in pleural- and bone-metastatic BRCA cells. In contrast, Adriamycin increases expression of Bcl-xl in pleural- metastatic but does not affect Bcl-xl expression in bone-metastatic BRCA cells. Based on these results we hypothesize that Taxol differentially regulates the expression of Bcl-2 and Bcl-xl in pleural- and bone-metastatic BRCA cells. To test this hypothesis we exposed pleural- (MDA-231) and bone-metastatic (MDA-231 F-10) BRCA cells to 0.2µg/ml Taxol for 48 hrs. Expression of Bcl-2 and Bcl-xl was assessed by immunoblotting. Exposure of pleural-metastatic BRCA cell line (MCF-7) to Taxol was used as positive control. We

found that Taxol decreases the expression of Bcl-2 in both metastatic BRCA cell lines. In contrast, Taxol increased the expression of Bcl-x1 in pleural-metastatic but decreased Bcl-x1 expression in bone-metastatic BRCA cells. These results up-regulation of Bcl-x1 in pleural-metastatic BRCA cells might be a possible mechanism for the development of resistance to Taxol. Furthermore, increased expression of Bcl-x1 reflects the development of a more aggressive phenotype. Correlation of these findings in an in vivo model is needed. Supported in part by COPENIC and Johnson & Johnson grant.

**A-6 Shedding of a 110 kD-sEGFR/ErbB1, a Cell Surface Isoform of the Epidermal Growth Factor Receptor, is Activated by Phorbol Ester in Breast Cancer Cells.** Mariana Pérez, Reiter, J.L., Mailhe, N.J., and Cora, E.M., UPR-Medical Sciences Campus, San Juan, PR and Mayo Clinic, Rochester, MN

Alternative splicing of the epidermal growth factor receptor (EGFR) gene generates a 3.0 kb transcript that encodes a 110 kD isoform of EGFR. This 110 kD-EGFR isoform contains the extracellular domain of the full-length 170 kD EGFR, and has an additional 78 unique carboxy-terminal amino acids. The 110 kD-EGFR is localized to the plasma membrane in placental tissue and in transfected fibroblasts. We have partially purified a 110 kD form of EGFR from human serum and microsequence analysis by mass spectrometry has demonstrated that this serum protein is derived from the 3.0 kb alternative EFGR transcript. We are studying the mechanism of shedding of this 110 kD-EGFR protein from the cell surface by immunoblot analysis and using an acridinium-linked immunosorbent assay specific for the extracellular domain of EGFR. We have detected 110 kD-sEGFR in the conditioned culture media of the breast carcinoma cell line MDA-MB-468. This protein is not detected in the conditioned culture media of the breast carcinoma cell lines MDA-MB-231 and MCF-7, which express the full-length EGFR, but lack the 3.0 kb transcript, nor in CHO cells stably transfected with the full-length EGFR. The shedding of 110 kD-sEGFR is a slow process. We have demonstrated that in MDA-MB-468 cells, the shedding of the cell surface 110 kD-EGFR is activated by phorbol 12-myristate 13-acetate (PMA), an activator of protein kinase C (PKC). In contrast, no 110 kD-sEGFR is released in response to PMA in MDA-MB-

231 cells. These results suggest that 110 kD-sEGFR arises from the cell surface isoform of EGFR and not from the full-length receptor, and that the shedding of 110 kD-sEGFR is a regulated process.

Supported by the NIH/NCI (CA73859 and CA85133) and the Regis Breast Cancer Research.

**A-7 Construction of Rat Chromosome 10 DA.F344(Cia5) Congenic Sub-lines Using a Marker-assisted Selection Protocol.** Wilfredo E. De Jesús-Monge, BS<sup>1</sup>, Tatiana V. Dracheva, PhD<sup>2</sup>, Elizabeth Schneider, BS<sup>2</sup>, Elaine F. Remmers, PhD<sup>2</sup>, Bina Joe, PhD<sup>2</sup> and Ronald L. Wilder, MD, PhD<sup>2</sup> · <sup>1</sup>University of Puerto Rico School of Medicine, San Juan, PR; <sup>2</sup>Inflammatory Joint Diseases Section, Arthritis and Rheumatism Branch, National Institute of Arthritis and Musculoskeletal and Skin Diseases, NIH, Bethesda, MD

Rheumatoid arthritis (RA) is a common autoimmune disease involving joint inflammation. Collagen-induced arthritis (CIA) is an animal model resembling RA that is used to evaluate genetic factors influencing this disease. DA rats are highly susceptible to CIA, whereas F344 rats are relatively resistant. *Cia5* on rat chromosome 10 (RNO10) is a non-major histocompatibility complex (non-MHC) quantitative trait locus (QTL) that regulates the severity of type II collagen-induced arthritis in (DA x F344)<sub>F<sub>2</sub></sub> rats. DA alleles of *Cia5* contribute to increased severity of CIA. The aim of the present study is to refine the genetic interval of *Cia5*. In DA.F344(Cia5) rats, *Cia5* transferred from the F344 genome to the DA background significantly reduced CIA severity. A marker-assisted selection protocol (MAS), using genetic markers, was used to identify rats in which recombination events reduced the length of the introgressed F344 RNO10 fragment. Sixty nine [DA x DA.F344(Cia5)]<sub>F<sub>2</sub></sub> rats were genotyped and 4 rats that retained heterozygosity in smaller intervals within the *Cia5* region were selected for breeding. Congenic rat strains derived from these animals will be phenotyped to localize genomic segments within *Cia5* that harbor CIA regulatory genes. Overlapping autoimmune and inflammatory disease susceptibility/severity loci in the genomic region harboring *Cia5* in rats and its homologous regions in mice and humans emphasizes the presence of important disease regulatory genes within *Cia5* on RNO10.

## Sección B

**B-1 Factores Asociados con la Adherencia/ Cumplimiento con las Terapias Antiretrovirales de un Grupo de Mujeres Puertorriqueñas con VIH/SIDA: Estudio Piloto.** M. Rivero, L. Santiago, C. del Valle, A. B. Morales. UPR, RCM, Decanato de Enfermería.

El propósito de este estudio fue examinar y describir los factores asociados con la adherencia/ cumplimiento con los tratamientos y el manejo del VIH, de un grupo de mujeres puertorriqueñas. El estudio se llevó a cabo en tres escenarios que proveen servicios a personas viviendo con VIH en Puerto Rico. Se realizaron cinco grupos focales con 39 mujeres VIH positivas, entre las edades de 25-75 años, con edad promedio de 43 años. El 62 por ciento de las participantes iniciaron terapia antiretroviral durante el primer año de recibir el diagnóstico de VIH. Las participantes identificaron como factores que influyen en el cumplimiento de los tratamientos: el miedo a la revelación del diagnóstico; la toma de decisión de iniciar tratamiento; la percepción de los proveedores de servicios de salud; y el apoyo de la familia, de los profesionales de la salud y de las personas significativas. Aunque las participantes sabían que el no-cumplimiento de los tratamientos las pone a riesgo de crear resistencia a los medicamentos, señalaron que no cumplen un 100 por ciento. Los efectos secundarios severos de los medicamentos como son la lipodistrofia, daño al hígado y riñones, provocan inconsistencia en el cumplimiento y negociación con el médico para cambios en los tratamientos. Las participantes expresaron sentir incertidumbre con sus tratamientos, no solo por los efectos secundarios, sino porque no saben hasta cuando estos van a ser efectivos y por las dificultades que confrontan para tener acceso a los mismos. Otras barreras señaladas, asociadas con el cumplimiento fueron: el número de pastillas; los arreglos de horarios; la alimentación; el simple olvido; los miedos a la revelación del diagnóstico; y las múltiples tareas y funciones socialmente asignadas a su género. Las relaciones interpersonales de confianza y respeto por la confidencialidad, así como un equipo de proveedores de la salud estable, fue mencionado por las mujeres como esencial para el manejo de su condición.

**B-2 Violencia conyugal y salud reproductiva en Puerto Rico, 1995-1996.** Ana Luisa Dávila, Ph.D. Hernando Mattei, Ph.D. Marta Bustillo, Ph.D. Escuela Graduada de Salud Pública, Recinto de Ciencias Médicas, Universidad de Puerto Rico.

El objetivo de este estudio es determinar la prevalencia de la violencia conyugal en las mujeres entre las edades de 15 a 49 años en Puerto Rico para el 1995-96. Este estudio describirá la magnitud, características, y circunstancias de los episodios de violencia que imperan en las relaciones de pareja de las mujeres en edad de procreación en Puerto Rico. Se analizan los datos recopilados en la Encuesta de Salud Reproductiva de Puerto Rico, 1995-96. Esta encuesta es representativa de todo Puerto Rico y de cada una de las seis regiones de salud que existían antes de la Reforma. En la encuesta se preguntó sobre temas como la violencia conyugal sobre los que hasta entonces solo se tenía información fragmentada. Entre los hallazgos más sobresalientes se encuentra que aproximadamente el nueve por ciento de las mujeres que han sostenido relaciones sexuales declararon haber sido forzadas a hacerlo en al menos una ocasión. Más del setenta por ciento de las mujeres alguna vez casadas o unidas admitieron haber peleado alguna vez con su pareja, una de cada cuatro afirmaron haber sido insultada, empujada o golpeada por su pareja y cerca del trece por ciento aseguró haber sido empujada o golpeada. Cerca de sesenta por ciento de las mujeres que admitieron que su esposo o compañero le ha dado, empujado, golpeado o le ha hecho cualquier daño protagonizaron episodios de violencia durante el último año. Estos sucesos fueron tan frecuentes como más de 10 veces en el último año para casi el veinte por ciento de las mujeres víctimas de este tipo de violencia. Los resultados obtenidos indican que el problema de violencia conyugal en Puerto Rico es mucho más generalizado de lo que se pensaba.

**Association of Social Class With Malocclusion  
In 12 Year Old Puerto Ricans.** C. Garcia, A. Elias,

**B-3**

C. Toro, UPR, School Of Dentistry, San Juan  
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The Dental Appearance Index (DAI) is a summary score of Dental Malocclusion status, used as a component in the World Health Organization (WHO) guidelines for population studies. DAI scores for severe malocclusion problems have been proposed to have a threshold of  $\geq 35$ . (Jenny, 93). Handicapping malocclusion has been considered to be at the  $\geq 39$  DAI level (Jenny, 96). Few studies have reported on DAI scores and social class level. The purpose of this study was to assess the association of severe malocclusion (derived from DAI scores) and public/private school attendance (as a surrogate for social class) in a population based sample of 12-year old Puerto Ricans. A probabilistic stratified sample of schools (71) was selected from 11 regions. Calibrated examiners (4) evaluated a total of 1,443 12-year olds in 1997. Three robust logistic regressions were estimated using as outcome the following dichotomous variables: 1)  $DAI < 35$  (0),  $DAI \geq 35$  (1); 2)  $DAI < 37$  (0),  $DAI \geq 37$  (1); 3)  $DAI < 39$  (0),  $DAI \geq 39$  (1). We utilized in the regression cluster (school) probabilistic weights and as explanatory variable type of school: Private (1), Public (0) and the following covariates: gender, region, urban/rural zone. The resulting odds ratio and confidence intervals were:  $DAI \geq 35 = 0.43$  (0.19, 0.93),  $DAI \geq 37 = 0.37$  (0.14, 0.95),  $DAI \geq 39 = 0.37$  (0.20, 0.85). Since all odds ratio are less than 1, we can conclude that lower social class is associated with severe and handicapping malocclusion in Puerto Rican 12-year old students (1997). This may reflect: 1) different treatment levels, or 2) growth and developmental factors associated with social class level at different regions.

**Exercise Frequency in a Hispanic Female  
Population age 40 to 80 and Risk of  
Osteoporosis.** Martin R., Romaguera, J., Jiménez,  
I.Z., Aponte, M.M., Santos, L. Dept. of Obstetrics  
and Gynecology and Dept. of Internal Medicine,  
University of Puerto Rico, School of Medicine.

**B-4**

The purpose of this study was to investigate the patterns of exercise in a Hispanic population of 40 to 80 years. A community based program offered by the University of Puerto Rico was started in March 2,000. A questionnaire, approved by our Institutional Review Board, was given to all eligible patients. All gave their informed consent and completed document. This abstract presents the exercise patterns in this population and the prevalence of osteoporosis or osteopenia. A total of 107 females were

studied. In this group, 49% were postmenopausal. Of the premenopausal, group (n=59) 34% do regular exercise. Based on the bone density done in the postmenopausal group (n=48) 50% do regular exercise. In the postmenopausal group, 50% were at high risk for osteopenia and/or osteoporosis as measured by the T value of less or equal to -1 using the calcaneus ultrasound machine. The use of regular exercise is relatively low in this Hispanic population in spite of a high risk for osteopenia and/or osteoporosis. Community Based educational programs should promote the importance of exercise as part of a comprehensive Health Promotion Program.

**Conocimientos y Creencias en Relación con el  
VIH/SIDA en la Población de Edad Avanzada que  
Asiste a los Centros de Personas de Edad  
Avanzada del Municipio de San Juan, Puerto  
Rico 1999.** A. E. Santiago-Orría

**B-5**

El propósito de esta investigación fue determinar los conocimientos y creencias que tiene la población de 60 años o más que asiste a los Centros de Personas de Edad Avanzada del Municipio de San Juan, acerca de la etiología de la enfermedad del VIH/SIDA, los modos de transmisión y las medidas de prevención. El diseño de investigación que se realizó fue de tipo descriptivo. Los datos fueron recopilados mediante la técnica de entrevista estructurada. El análisis de los datos fue de tipo cuantitativo. Se utilizó la prueba de independencia entre variables, Chi Cuadrado, para medir la asociación entre las variables sexo, edad, nivel educativo y conocimiento. Para fines de la investigación, conocimiento se definió como entendimiento de información probada científicamente, mientras que las creencias se definieron como ideas que no necesariamente han sido probadas científicamente. De la investigación se desprende que la población entrevistada no tiene un conocimiento adecuado sobre el VIH/SIDA, en específico sobre las áreas de conceptos generales, etiología y las medidas de prevención. Las puntuaciones obtenidas por los entrevistados reflejan un nivel de conocimiento adecuado en cuanto a los modos de transmisión. En cuanto a las creencias, un porcentaje significativo de los encuestados señaló que la enfermedad del SIDA le da solamente a los homosexuales y adictos a drogas. Cerca de la mitad de los entrevistados piensa que el virus del SIDA puede transmitirse por la picada de un mosquito u otro insecto, por actividades del diario vivir como el compartir platos, cubiertos o vasos, comer en restaurantes y el utilizar baños públicos. Las conclusiones destacan que no existe asociación estadística significativa



entre el nivel de conocimiento sobre el VIH/SIDA y el sexo y nivel educativo de las personas entrevistadas. No obstante, se encontró que existe asociación entre el nivel de conocimiento y la edad de los entrevistados, encontrando que a menor edad, mayor es el nivel de conocimiento. Este estudio parece sugerir que las campañas sobre VIH/SIDA han sido exitosas en comunicar conocimientos sobre los modos de transmisión y medianamente exitosas en comunicar conocimiento acerca de las medidas de prevención.

**B-6** **Importance of Early Sexual Activity Education Program for the Hispanic Adolescent Population in Puerto Rico.** Dick, M, Aponte, M.M., Martin, R., Arabia, C. González, R., Romaguera, J. Dept. of Ob-Gyn. and Dept. of Ped. UPR, School of Medicine.

Sexual activity among young students has been increasing during the last decades. Puerto Rico has a high incidence of teenage pregnancy (20%), and as compared to the US, the trend is not decreasing. The purpose of this study was to determine sexual activity patterns of adolescents attending 7<sup>th</sup> grade in Puerto Rico. An Adolescent Health Program was established during 1999-2000 as part of a school based research project of our OB-GYN program. A group of OB-GYN and Pediatric residents and medical students participated in its implementation. The sample consisted of 401 students attending 7<sup>th</sup> grade at five public schools in metropolitan areas. All schools had similar demographic characteristics. An anonymous survey using an interactive computer program was employed as part of this Adolescent Health Promotion Program. Of the 401 students, surveyed 27.1% were sexually active. Since no data could be found to compare this population with their age matched groups, data from studies pertaining to older students' was used to identify the difference in behavior. Our students perceive adolescent pregnancy as a difficult, unpleasant experience that marked their lives. Some students view adolescent pregnancy as a way to leave home, to feel woman/man, or to feel loved. Adolescent Health Promotion Programs aimed to reduce high-risk behavior such as sexual activity should be established at an earlier age than in this population because of an already established risky behavior. Further studies are needed to assess which educational programs influence most effectively the prevalent high-risk behavioral adolescents in this population.

#### DMFS Rates and CFI in 12-Year Old Puerto

**B-7** **Ricans.** Jimenez, P.\*, Elias, A., Toro, C. (UPR, School of Dentistry, San Juan, Puerto Rico), PSOTER, W., New York University, Dental College.

Naturally occurring water fluoride levels throughout Puerto Rico are 0.2 ppm and the island has no community based fluoridation programs. The purpose of this project was to examine the ecological association between DMFS prevalence rates and Community Fluorosis Index (CFI) scores. CFI was used as a proxy for past fluoride exposures, at the community level. Calibrated examiners (4) evaluated a total of 1,443 12-years old in 1997. A probabilistic stratified sample of schools (74) were selected from 11 regions. Individual DMFS and fluorosis (Dean's index) scores were converted to DMFS/100 children and CFI, respectively by regions. DMFS/100 ranged from 553 to 871, and CFI scores ranged from 0.03 to 1.24 across the regions. Linear and exponential rate models were fitted to model DMFS/100 on CFI assuming both Gaussian and Poisson distributions (Gen Mod., SAS). No model approached statistical significance: 0.97 (exponential Gaussian), 0.89 (linear and exponential Poisson), and 0.97 (linear Gaussian). Relatively narrow ranges for DMFS rates and CFI scores, as well as the limited number of regions considered were some potential limitations of the analysis. This study failed to demonstrate an ecologic association between DMFS/100 children and CFI in a non-fluoridated community with CFI's at a public health significance levels of "medium" and less.

**B-8** **A Phenomenological Study to Explore the Experience of Dominican Immigrants with the Health Services in Puerto Rico and its Impact on their Quality of Life.**

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This investigation aimed to examine and describe in a systematic way the meaning, essence, and basic structure of the Dominican immigrants' experience in Puerto Rico with the health services available in their community. Also analyzed was the impact of this experience on the quality of their life and the ways in which they face this impact in order to reach their goals and aspirations. The study utilized qualitative phenomenological methods, which allowed for a more in-depth look at the human experience. The total sample size was of 8 people, 5 females and 3

males, with an average age of 47 years, who had lived in Puerto Rico for an average of 14.5 years. Relevant data was collected primarily through taped interviews that were then scrutinized in search of recurring themes and concepts. This resulted in a structural synthesis of the immigrants' living experience. The investigation yielded 5 central themes/concepts: the yearning for residency and American citizenship; the process of adapting to Puerto Rican culture and to thrive in daily interactions; the quest for adequate public and private health services; definitions of what defines good quality of life; and their expectations of health care providers, and more particularly, of nurses. Female participants defined quality of life as material prosperity, physical health, peace, self-improvement, house ownership, among others, while for male participants, the most outstanding characteristics were strong family bonds, hard, honest, and fair work, and house ownership. Both genders looked to the future, and moved towards promising prospects, in hopes that the next generation will complete what they leave unfinished. Finally, immigrants manifested their expectations that when they seek health care, they will not be discriminated against or ignored, that the intrinsic need of nursing is to treat people well, based on respect, good manners, and attention to individual needs rather than nationality. This study proved that there is a need for culturally sensitive-strategies for more effective intervention as health care providers meeting the needs of the Dominican population in Puerto Rico.

## Sección C

**C-1** **Bone Density Screening in Hispanic Women Living in Puerto Rico.** Aponte, M.M., Jimenez, I.Z., Romaguera, J., Dept. of Internal Medicine and Dept. of Obstetrics and Gynecology, University of Puerto Rico, School of Medicine.

To screen Hispanic women 35 years and older, for low bone density, in a community-based clinic using calcaneus ultrasound. During the month of May 2000, 128 women were screened during our Community Outreach Program for Women's Health. The Hologic Ultrasound machine for measurement of the calcaneus density was used. Their ages ranged from 35 to 68 years. In this group, 73 (57%) were pre-menopausal, 24 (19 %) were peri-

menopausal, and 31 (24 %) were post-menopausal. Of the peri-menopausal group, 14 out of 24 (58%), had bone densities with T value <-1.0. None of them were using hormonal replacement therapy. Of the post-menopausal women, 30 % had history of bilateral oophorectomy and 41% had a T value less or equal to -1.0. Thirty three percent of the groups with positive bone densities were not taking hormonal replacement therapy. Although the group screened was small, there is a high risk for osteoporosis in the peri and post-menopausal population in our country, which require further study. Fifty-eight percent of the peri-menopausal women screened and thirty-three percent of the post-menopausal patients were not receiving adequate therapy at the time of the study. DEXA of the hip and spine should be done to the group with T value less or equal to -1.0 to compare these values with the calcaneus ultrasound and to assess the prevalence of osteopenia and or osteoporosis in this population.

**C-2** **Tratamiento Integrativo No-Tóxico del Trastorno de Déficit de Atención e Hiperactividad.** Michael J. González y Jorge R. Miranda-Massari, Proyecto InBioMed, Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela de Salud Pública y Escuela de Farmacia.

El trastorno de déficit de atención e hipersensitividad (TDAH) es el desorden de comportamiento más común en niños. Miles de niños son tratados con fármacos estimulantes para esta condición. Estos estimulantes tienen un sin número de efectos adversos como anorexia, dolores de cabeza, náusea, insomnio, taquicardia, desórdenes de comportamientos como psicosis, manía y son extremadamente adictivos. Antes de considerar un régimen farmacológico se deben utilizar terapias más inocuas pero con posibilidad de ser efectivas. Dada nuestra experiencia con un pequeño número de pacientes (6) proponemos un tratamiento integrativo no tóxico que incluye alimentación baja en azúcares simples y aditivos, vitaminas del complejo B (sublinguales), minerales, ácidos grasos omega 3, probióticos (*Bacillus acidophilus*) y el fosfolípido fosfatidilserina. Con este tratamiento no tóxico, ni adictivo que incluye modificación dietaria, suplementación, detoxificación y corrección de disbiosis intestinal los pacientes de TDAH reducen marcadamente sus síntomas. Es lógico pensar que estas terapias van a la raíz del problema en TDAH en vez de sólo tratar el síntoma.

**C-3** **A Case Series of Complicated Cases of Child Sexual Abuse.** B. Mirabal-Colón, María N. De Jesús. Department of Pediatrics, School of Medicine, University of Puerto Rico

This case series reviews the clinical presentation, diagnosis, interdisciplinary follow up and outcome of 3 children treated at the Biopsychosocial Program of the Dept. of Pediatrics for suspected child sexual abuse. The first child was a 10 year old black female with a history of sexual abuse by father during infancy. The mother reported severe constipation and fecal incontinence since infancy, requiring use of sanitary napkins; a rectal biopsy revealed ganglion cells. A colposcopic exam showed absent/attenuated hymen at 7–8 o'clock (supine) and scarring of fossa navicularis. On follow up, abundant fecal material was observed in the vagina. A barium enema and two exams under anesthesia were negative for rectovaginal fistula. After case discussion with a pediatric surgeon and gastroenterologist, the child underwent a colostomy. She has favorably adapted to it, without recurrence of fecal incontinence. The second patient is a 6 year old girl referred due to severe sexual/physical assault by her grandmother. She was taken to OR the same day due to a grade four laceration of the vagina, extending to the anus. Trauma to left eye caused complete loss of vision. Later, a rectovaginal fistula was observed and a colostomy performed. In 1½ years, child protection, validation of events and intensive, abuse-focused, individual and group psychotherapy were offered. Coordination with Surgery, Family Services Dept., law enforcement and a forensic psychiatrist was done. After 1½ years, the colostomy was closed and intestinal reanastomosis performed, without recurrence of fistula. As a result of interdisciplinary and interstate collaboration, the child resides in a protected environment in the USA. The last patient, a 14½ years old male, with mild mental retardation, was referred with anal warts. He disclosed sodomy by a friend. Colposcopy showed multiple, small anal warts consistent with Condyloma acuminata. He was referred to Dermatology & he was treated with podophyllin. Two months later, warts had proliferated without reexposure. After case discussion with Dermatology, Imiquimod topical cream was given; 5 months later, no lesions were seen. Interdisciplinary management of child sexual abuse is recommended, particularly in complex cases. (VOCA #2000-VA-GX-0072)

**C-4** **Red Blood Cell Alloimmunization in Pediatric Patients with Sickle Cell Disease.** Santiago-Alvarado, O., Climent-Peris, C. Department of Pathology and Laboratory Medicine, University of Puerto Rico, Medical Sciences Campus.

Red blood cell transfusions (RBCs) are frequently used in sickle cell disease (SCD). However, repeated RBC transfusions are often complicated by alloimmunization. Fifty-four pediatric patients with SCD were evaluated for alloimmunization; all patients had been transfused previously. Twelve patients (22%) were found to be sensitized to various red cell antigens. The median number of transfusions received by alloimmunized patients was 16 compared to 3 in the unsensitized group, indicating an increased risk with more transfusion exposures. The most frequently observed alloantibodies were anti-E (35%) anti-C (24%) and anti-K (18%). The incidence of RBC alloimmunization of SCD in Puerto Rico is similar to the majority of studies published in U.S.A. Phenotypically matched blood for Rh system and Kell system should be transfused whenever possible to prevent alloimmunization in these patients.

**C-5** **Topical Antimicrobial Therapy in Prevention of Early Childhood Caries.** L. Lopez, R. Berkowitz\*, M. Moss, P. Weinstein, (University Of Puerto Rico, University Of Rochester, University of Washington, USA)

Early Childhood Caries (ECC) is microbiologically characterized by heavy infection of mutans streptococci (ms) on dental surfaces. Accordingly, it is reasonable to speculate that suppression of dental ms levels would decrease risk for ECC. On this basis, a randomized double blind placebo controlled study was performed. The study population consisted of 68 subjects (age: 12 to 19 months at their time of entry into the study; sex (36F/32M) who were clients of a WIC clinic in Puerto Rico. Inclusion criteria included: (1)unremarkable medical history; (2)presence of 4 maxillary primary incisors (ME,1) with no visible defects; (3)clinically caries free; (4)use of a nursing bottle at naptime and/or bedtime which contained a liquid other than water; (5)two consecutive ms positive cultures (utilizing MSB agar) from pooled MPI plaque. The subjects were randomized into 2 groups. The 33 subjects in the experimental group and the 35 subjects in the control group

were evaluated every 2 months during the one year study period. At each evaluation, the subject had 10% povidone iodine (experimental group) or placebo (control group) applied to their dentition. The placebo was commercial instant tea (without lemon or sweetener) and deionized water. Treatment failure was defined as the appearance of a white spot lesion(s) on any of the MPI during the study period. Nine of the 35 (26%) control subjects and 1 of the 33 (3%) experimental subjects experienced treatment failure (Fisher's Exact test:  $p=0.014$ ). These observations show that topical antimicrobial therapy reduces risk for the development of ECC in high risk children. This study was supported by NIH grants IP20RR1126 and R03 DE12053.

**C-6 Gram-positive and Gram-negative Susceptibility on Puerto Rico Medical Center, Data Summary from January to June 2000.** Fontanez J, Sante M.I. UPR. Medical Sciences Campus. Department of Pathology and Laboratory Medicine.

Using the data collected by the Microbiology section of the ASEM laboratory from January to June 2000 we pretend to inform the medical community the emergence and spread of antimicrobial resistance and how with the monitoring of the antimicrobial use we reduce it. Data from the automated Vitek system and disk diffusion method were pooled during the entire study period, then separated in clinical important gram-negative and gram-positive isolates. To calculate the susceptibility percent we divided the number of susceptible isolates by the total number of isolates for which susceptibility testing had been performed and multiply by one hundred. The total number of isolates was 4,219, of which 79% were gram-negative; the *E. coli* was the most common (19%) and presented a resistance of 3% to ceftazidime. *K. pneumoniae* presented a resistance of 47% to ceftazidime, *P. aeruginosa* presented a resistance of 33% to ceftazidime, 44% to cefepime, 44% to carbapenams, and 19% to amikacin. *Acinetobacter* spp. presented a resistance of 41% to carbapenams, 75% to aminoglycosides, 75% to quinolones, and 71% to ceftazidime. Of the gram-positive organisms the *E. faecalis* was the major pathogen representing the 9% of isolates and presented a resistance of 20% to high level gentamicin (HLG), and 26% to vancomycin. *E. faecium* presented a resistance of 77% to HLG, and 71% to vancomycin. *S. aureus* presented a resistance of 50% to methicillin, and 2% to vancomycin. *S. pneumoniae* presented a resistance of 0% to penicillin, and 25% to clindamycin. The effects of bacterial resistance as multidrug-resistant organisms diminish the medical community's ability to treat and

control the spread of infection. Bacterial resistance limits the antimicrobial options available to clinicians for the treatment of severe infections. Also the emerge of *Acinetobacter* spp. as an important nosocomial pathogen with multidrug resistance pattern.

**C-7 Hormonal Replacement use in a Postmenopausal Hispanic Female Population aged 40 to 80.** Santos, L., Leon, A., Aponte, M.M., Romaguera, J., Jimenez, I.Z. Dept. Of Ob-Gyn and Dept. of Internal Medicine, University of Puerto Rico, School of Medicine.

The purpose of this study was to elucidate the hormonal replacement therapy (HRT) pattern of use in a Hispanic female population attending community based clinics. A Community based program offered by the University of Puerto Rico was started in March 2,000. As part of the program a questionnaire approved by our Institutional Review Board, was given to all patients attending a clinic to screen for osteoporosis. Informed consent was given by all eligible patients. The calcaneus ultrasound machine was used to do bone density studies. This abstract presents the pattern of HRT use of the first 105 females aged 40 to 80. In the population aged 40 to 49 ( $n=71$ ), 24% were postmenopausal as compared to 94.4% in the age range 50 to 80 ( $n=36$ ). Of the post menopausal women 60.4% were using HRT at the time of the completion of the questionnaire. Previous use of HRT was reported in 40% of patients. A T-value less or equal to  $-1$ , which predisposes a patient to osteopenia and osteoporosis, was present in 50% of the postmenopausal patients. The frequency of a T value less or equal to  $-1$  in the patients using HRT was 47% and in the group without HRT was 54%. Of the 50% of the postmenopausal females in this sample are at high risk for osteoporosis, only 60.4% are using HRT. Further studies need to be done in this population to address risk factors for osteoporosis. Educational interventions in this population are also needed.

**C-8 Propranolol Accelerates Progression of Induced Labor.** Torres, R.; Santiago, P.; Rivera, J.; Adamsons, K., Dept. Of Ob-Gyn, School Of Medicine

We have reported previously that elimination of the inhibitory action of epinephrine upon the beta-adrenergic receptors of the myometrium shortens, rather dramatically the duration of labor in primigravida minutes cesarean

sections for the indication of failure of labor to progress. In the group of young primigravidas the mean duration of labor was 3.9 hrs.(range 1.2 hrs - 6.0 hrs.) At present propranolol (2 mg i.v.) is given routinely in our department to all primigravidas admitted in labor for vaginal delivery. The purpose of this report is to share our experience gained in on ongoing study with propranolol in induced labor in primigravidas and in multiparas. The indications for induction have been: prolonged gestation, oligohydramnios near term, gestation diabetes mellitus with accelerated fetal maturation with T4, preeclampsia and fetal malformations. Control group was matched for parity and gestational age. Propranolol 2 mg i.v. was given at the time of initiating

treatment with intravaginal Cytotec 50 mg q 4 hr., and repeated if necessary q 4 hr. Propranolol did not change progress of labor in patients in whom Cytotec failed to induce regular uterine contractions. However, once contractions became regular the mean time to delivery was 8 hrs and 20 min, (range 4 hrs 3 min to 9 hrs 11 min) in contrast to the controls in which the mean time to delivery was 17 hrs and 20 min. The more rapid progression of labor was achieved by reducing the postcontraction relaxation of the myometrium, and not by increasing the frequency, duration or intensity of the contractions.

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**P-1** **Effect of Low Temperature on Tracheal Smooth Muscle Contractile and Relaxing Responses Evoked by EFS.** Orlando González and G.E. Santacana. Dept. of Physiology- University of Puerto Rico-School of Medicine, San Juan, Puerto Rico

The aim of this work was to evaluate the effect of low temperature (LT) on the contractile and relaxing responses of rat tracheas (RTs) after electrical field stimulation (EFS). Voltage-dependent (10-60V, 40Hz) and frequency-dependent (0.1-60 Hz, 40V) response curves were constructed at 37 and 18°C after the activation of tracheal intramural nerves with a Grass S88 stimulator. The EFS that produced half of the maximum contractile response ( $ES_{50}$ ) at 37 or 18°C was determined and considered as the dependent variable. The % relaxation of pre-contracted RTs (EFS; 5Hz, 40V) to sodium nitroprusside (SNP;  $1 \times 10^{-7}$ – $1 \times 10^{-3}$ M) isoproterenol (ISP;  $1 \times 10^{-9}$ – $1 \times 10^{-5}$ M) and to 20mM potassium chloride (KCl) after low- $K^+$  inhibition of the  $Na^+/K^+$  pump at 18 and 37°C were determined. We found that the tracheal responses elicited by EFS at 37 and 18°C were completely blocked with 1 $\mu$ M atropine. LT slightly increases the voltage-dependent  $ES_{50}$ , from  $33.7 \pm 4.0$  to  $37.8 \pm 4.8$ V,  $n=5$  but decreases the frequency-dependent  $ES_{50}$  from  $19.3 \pm 4.3$  to  $1.0 \pm 0.28$  Hz,  $n=5$ ,  $p < 0.05$ . Relaxing responses to SNP, ISP and KCl at 37°C correspond to  $43.5 \pm 6$ ,  $36.7 \pm 12$  and  $12.1 \pm 1.5$  % respectively. No significant tracheal relaxations were elicited at 18°C. Our results indicate that in RTs, LT enhances tracheal sensitivity to EFS and decreases its response to bronchorelaxants. The LT-dependent enhanced contractile response is observed only after a low frequency stimulation range (0.1-20Hz), that is very close to the frequency of vagal stimuli required to induce bronchoconstriction *in vivo*. Furthermore, LT abolishes the sensitivity of RTs to exogenously added bronchorelaxants (NO and ISP). In addition, LT appears to decrease the  $Na^+-K^+$  pump activity; this effect has been associated with increased tracheal hyperreactivity *in vitro*. ACH appears to be the main endogenous neurotransmitter involved in neurally-mediated contractile responses at 37 and 18°C. We conclude that LT induces a significant enhancement on the airway smooth muscle contractility and sensitivity in response to low-frequency electrical field stimulation.

**P-2** **Mammography Compliance among Middle-Aged Women in Puerto Rico.** M. SÁNCHEZ AYÉNDEZ, A.L. DÁVILA, M. BUSTILLO, C.M. NAZARIO, M.C. LARRIUZ, G. MARTINÉZ. School of Public Health, University of Puerto Rico, PO Box 365067, San Juan, Puerto Rico 00936.

Mammography for low-income and minority women is an important intervention issue as it is still under-used by minority and low-income women. The results discussed hereinafter pertain to the first phase (focus groups) of a larger study funded by DoDBCRP that focuses on compliance with the screening guidelines among low-income middle-aged women in Puerto Rico. Focus groups were conducted to gain insight to breast cancer and screening knowledge and attitudes, screening practices, and barriers to screening mammograms of low-income women ages 40 to 64. Two community health centers in different regions in Puerto Rico were selected: large metropolitan inner-city area and north-eastern area serving urban and rural populations. Seven focus groups were conducted. The results indicate that the participants view cancer as a cell disorder and that breast pain or discomfort is a factor associated to the disease. The women have knowledge of breast self exam, clinical breast exam and mammogram as early detection tests as well as of the usefulness of mammograms. No clear knowledge of current screening mammogram guidelines was found among the participants. Apprehensions about the discomfort caused by the mammography procedure and fear of a cancer diagnosis are the most prevalent personal barriers. Important systemic barriers for mammogram compliance are: economic factors, transportation and patient-physician relationship. The information obtained from the focus groups will be used to develop a culturally and socially sensitive questionnaire that will be used in a survey of 300 low-income middle-aged women in Puerto Rico.

**P-3** **Diseño y Evaluación de un Programa de Educación sobre la Vacuna con la Influenza para Adultos de 65 Años o más en una Farmacia de Comunidad.** Marrero W., Hernández, L. Y Gutiérrez, L.M. Departamento de Práctica en Farmacia, Escuela de Farmacia, Recinto de Ciencias Médicas, UPR.

**Objetivo:** Evaluar las necesidades de educación con relación a la vacuna contra la influenza de los pacientes de 65 años o más en una farmacia de comunidad; diseñar un programa de educación; y evaluar el programa de educación y sus resultados.

**Metodología:** Estudio longitudinal de educación al paciente dividido en tres fases. Fase I – Cuestionario para identificar las causas por las cuales los adultos de 65 años o más de la Farmacia San Luis en San Lorenzo no tienen su inmunización actualizada. Fase II – Utilizando la información de la Fase I se diseñó un programa de educación a pacientes de 65 años o más sobre la vacuna, vacunación e inmunización contra la influenza. Fase III – Estudio aleatorio controlado para evaluar conocimiento y barreras a la vacunación; resultados clínicos (e.g. porcentaje de vacunación), económicos (e.g. hospitalización) y humanísticos (e.g. satisfacción con su farmacéutico). Se evaluarán cambios en conocimiento, barreras y porcentaje de vacunación a los tres meses de haberse vacunado. Al año de haberse vacunado se evaluarán cambios en conocimiento, barreras, porcentaje de vacunación, resultados clínicos y económicos. En ambos períodos se evaluará satisfacción con su farmacéutico.

**Resultados:** Participaron 100 pacientes, asignados de modo aleatorio a grupo control e intervención. Un 75% del grupo de intervención que asistió al programa de educación se vacunaron y mostraron una tendencia a mejorar en conocimiento. De una escala de 0-4, el promedio de satisfacción con el farmacéutico fue de  $3.94 \pm 0.19$ .

**Conclusión:** En la Farmacia San Luis en San Lorenzo se observa una tendencia a mayor conocimiento luego de un programa a personas de 65 años o más presentado por un farmacéutico.

**P-4 Importance of Stochastic Variation in Disease Epidemics: Computer Simulation of Measles.**  
Philip C. Specht, Ph.D. Pharmacology Dept,  
UPR, School of Medicine, San Juan PR.

Many diseases persist in a population over very long time periods, yet show dramatic short-term fluctuations. Equations describing the relation between host and disease can be derived from basic principles, and substitution of average values observed in the natural disease can predict the equilibrium conditions. Computer simulations, built using these equilibrium equations, do not spontaneously exhibit the observed short-term fluctuations of the natural disease. In this study, the computer simulations have been expanded to explore the conditions under which epidemics can occur, while maintaining long-term persistence, using measles as a typical contagious disease. It was found that the dynamic characteristics of the natural disease behavior could be reproduced in the simulation, by adding a small amount of normally-distributed random variation to the infection

rate. Other important characteristics of the natural disease, such as disease-free periods in local areas followed by clustered epidemics, could be reproduced by dividing the global population into independent groups with limited intercommunication. These results have important implications for public health vaccination policy. (Supported in part by the COPENIC Program of the Deanship of Academic Affairs of the UPR Medical Sciences Campus.)

**P-5 Accelerated Stability Testing and Thermal Analysis For Naproxen Powder and Tablets.** M. Donoso, E. S. Ghaly: School of Pharmacy, Medical Sciences Campus, University of Puerto Rico.

Stability is an integral part of formulation development of a pharmaceutical dosage forms. It gives evidence of stability of drug product upon storage under different conditions. Traditionally, multi-temperatures accelerated stability studies and the Arrhenius approach are used to determine the shelf life. However there are several problems such as: time consuming, cost and the fact that the mechanism of drug degradation at high temperature can be different from that at room temperature. In accelerating stability testing, the activation energy is calculated by extrapolating at room temperature. However in the differential scanning calorimetry (DSC), the calculation of activation energy, and degradation rate constant at room temperature are shown to be rapid and useful. The enthalpy was measured by DSC in the range of  $25^{\circ}\text{C}$  to  $91^{\circ}\text{C}$ , and the activation energy was calculated at room temperature. The chemical degradations of naproxen powder and tablets were detected by using UV spectroscopy. The amount of drug remaining without decomposition at different temperatures:  $40^{\circ}\text{C}$ ,  $50^{\circ}\text{C}$  and  $56^{\circ}\text{C}$ . was investigated at different time intervals for 4 months. The activation energy was calculated using accelerated stability testing for naproxen powder and tablets and the values were 1.09 Kcal/mol (naproxen powder) and 1.069 Kcal/mol (naproxen tablets). The DSC was used to determine the activation energy for tetracycline capsules, naproxen tablets, commercial naproxen tablets and naproxen powder and the activation energy values at  $25^{\circ}\text{C}$  were found to be: 23.27, 1.45, 0.67 and 2.32 Kcal/mol. This investigation showed the feasibility of using the DSC method instead of accelerating stability testing to determine activation energy for powder and drug products at  $25^{\circ}\text{C}$ .

**P-6** **Uniformity of Content of Spheres Containing Low Concentration Drug.** V.A. Rivera, E.S. Ghaly: School of Pharmacy, Medical Sciences Campus, University of Puerto Rico.

The technique of preparing spheres from extrusion of a moist powder followed by rounding on a rapidly rotating serrated plate is finding increasing interest and acceptance criteria within the pharmaceutical industry. The main objectives of this research are to use the extruder / spheronization process to solve the problem of uniformity of content of low dose drugs. Three methods were used for preparation of chlorpheniramine maleate dosage forms: spheres prepared by extruder/marumerizer technology; granules prepared by wet granulation and physical mixtures. Three levels of drug were used: 1% w/w; 2 and 5% w/w. All formulations were compacted into tablets using single punch instrumented tablet press, equipped with 12/32" flat face punches. Target tablet weight was 450 mg  $\pm$  5% and target hardness was 6-8 Kp. The different dosage forms were assayed for drug content using UV spectroscopy at a wave length of 264 nm. The data showed that spheres containing 1% w/w drug gave percent relative standard deviation (%RSD) equal to 12; granules gave % RSD equal to 14 and powder gave %RSD equal to 14. The same trend was true for dosage forms containing 2% chlorpheniramine maleate: spheres gave % RSD equal to 6; granules gave % RSD equal to 8 and powder gave % RSD equal 7. In general, it can be concluded that low dose drug can be more uniformly distributed in spheres than in granules or powder mixture. Spheres prepared by extruder/marumerizer technology is a simple method, reduce steps of processing, possess good flow and solve the problem of uniformity of content of low dose drugs.

**P-7** **Enhancing Solubility of Glipizide Using Bile Salt/Phospholipid Mixed Micelles.** K. Martínez, E.S. Ghaly: School of Pharmacy, Medical Sciences Campus, University of Puerto Rico.

Glipizide is a sulfonylurea antidiabetic drug that helps in lowering blood glucose concentration in diabetic patients. However the low solubility of the drug, may affects its bioavailability. In this investigation, solubility of glipizide was improved by choosing a mixed micelle formulation at an appropriate concentration and pH. This helped to entrap the maximum amount of glipizide inside the mixed micelle and increased its solubility. Bile salt / phosphatidyl choline mixed micelles at different ratios were used to determine which micelle formulation is the best for

enhancing the solubility of glipizide. The phosphatidyl choline (PC) used were Soy PC and Egg PC, and the bile salts were sodium taurocholate (STC), sodium desoxicholate (SDC), and sodium cholate (SC). Micelles were prepared using mixture of bile salt/phosphatidyl choline at 1:1 ratio. The coprecipitation method was used to prepare the mixtures of Egg PC/SC; Soy PC/SC; Egg PC/SDC; Soy PC/SDC; Egg PC/STC and So PC/STC. Excess amount of glipizide was added to 10 ml of each of the different micelle solution in test tubes, closed and shaken to dissolve the maximum possible amount of glipizide. The supernatant solution was separated by centrifugation and analyzed to determine drug dissolved in the micelle using UV spectroscopy at 276 nm. The amount of drug dissolved in the micelle formulations were: 1.7 mg/ 100 ml of STC/SPC mixture; 1.5 mg/100 ml of STC/SPC mixture; 3.45 mg/100ml of SC/SPC mixture; 4.8 mg/ 100 ml of SC/SPC mixture; 104.23 mg/100 ml of SDC/SPC mixture and 2.55 mg/100 ml of span 80. This study demonstrated that bile salt/phosphatidyl choline mixed micelles have the capacity to enhance the solubility of slightly soluble drug.

**P-8** **Poly (D,L-lactide) Nanoparticles as a Drug Delivery System for Theophylline.** I. Roldan, E. S. Ghaly: School of Pharmacy, Medical Sciences, Campus, University of Puerto Rico.

Nanoparticles are colloidal delivery systems consisting of polymeric materials in which drugs and other components are dissolved, entrapped, encapsulated, and / or absorbed. The objective of this investigation is to enhance the therapeutic efficacy and to reduce the toxicity of theophylline. Also, to investigate the effects of several parameters such as polymer and drug levels on physical properties of the nanoparticle formulations. Nanoparticles were prepared by precipitation using the solvent evaporation method. The drug model used was theophylline and the polymer used was poly (D,L-lactide) biodegradable polymer. The levels of the polymer and drug varied. Also, two methods were used for preparation of the nanoparticles (freeze drying and without freeze drying). The dissolution data in distilled water using USP basket rotational method at 50 rpm showed that nanoparticles containing ratio of 1:1 drug to polymer gave entrapment efficiency of 4.5% but a rapid drug release profile was observed. The mean percent dissolved after six hours was found to be 99%. Increasing the polymer level using a 1:5 drug to polymer ratio decreases the drug entrapment to 1.5%. However, it demonstrated a slower drug release profile compared to formulations containing

1:1 drug-polymer ratio. The mean percent drug dissolved at six hours was 95%. The data obtained also showed that increasing polymer level decreases the drug entrapment in poly (D,L-lactide) nanoparticles. However, the drug release from the nanoparticles was decreased. This study indicated that levels of polymer, drug and methods of preparation can affect drug entrapment and drug release from the nanoparticles.

**P-9 Mucoadhesive Delivery System for Antihistaminic Drug Using Bioadhesive Polymers.** G. Ruíz, E.S. Ghaly: School of Pharmacy, Medical Sciences, Campus, University of Puerto Rico.

The development of mucoadhesive device with the ability to retain pharmacologically active agents for extended periods of time on any mucosal epithelia confers a number of potential therapeutic advantages. The goal of this proposed investigation is to develop a new controlled release for the antihistamine drug chlorpheniramine maleate, using a mucoadhesive dosage form composed of two layers tablets and to investigate the effect of the polymer level (10%, 30% and 40%) on bioadhesion of the dosage form. Two polymers were studied water soluble polymer (1 carrageenan) and water insoluble polymer (polyacrylic acid). The direct compression method used to prepare the tablet, target weight and hardness were 400 mg + 5% and 6-8 Kp respectively. The best polymer level was selected and mucoadhesive tablets containing combination of two polymers at a ratio of 1:3; 1:1 and 3:1 carrageenan :poly acrylic acid were prepared and evaluated. The drug release from the tablets was investigated, using the basket rotational dissolution apparatus at 50 rpm. The results showed that the mean percent drug dissolved decreased with the increase of polymer level. Tablets containing 10% w/w carrageenan released approximately 100% of drug at 2 hours of testing dissolution while tablets containing 30% released 68.2% and tablets containing 40% carrageenan released 63% of the drug. Tablets prepared with polyacrylic acid using 10% and 30% level released 96% and 89.5% drug at 2 hours while tablets containing 40% polyacrylic acid resin released 91.3% drug. This study demonstrated the feasibility of preparing mucoadhesive tablets. This method has potential to offer the formulator control over the drug release.

**P-10 Relationship Between Internal Phase Volume, Type of Emulsifying agent and Emulsion Stability.** E. Sepulveda, E.S. Ghaly: School of Pharmacy, Medical Sciences Campus, University of Puerto Rico.

Emulsions are widely used as topical delivery systems for drugs. However, they are thermodynamically unstable systems. The objective of this research is to optimize the stability of cetyl alcohol/stearyl alcohol emulsions in terms of internal phase volume, emulsifier type and concentration. Oil-in-water emulsions were prepared by phase inversion and the physical properties of the emulsions such as: particle size, pH, viscosity and sedimentation volume were evaluated. Stability studies at room temperature, 40°C, 50°C and under stress conditions were performed. Tween 80 and Span 60 were used as control emulsifying agents. The amount of internal phase components (cetyl alcohol and stearyl alcohol) and the concentration of the emulsifier were varied and stability of the emulsions was investigated. Emulsion formulations containing 50% internal phase volume resulted in a highly viscous system while emulsion containing 30% internal phase volume and only 3% emulsifying agent presented phase separation at room temperature. Emulsion viscosity increased during storage while pH values decreased. Viscosity of formulation containing 30% internal phase volume (56.71 cetyl alcohol: 36.3 stearyl alcohol: 7 emulsifying agent) was 7440 centipoise (c.p) and the viscosity after 15 days was 7733 c.p.; 7644 C.P. at 40°C and 8186 c.p. at 50°C. As the level of emulsifying increased and the ratio of cetyl alcohol to stearyl alcohol remained constant, the viscosity increased from 1035 c.p. to 1187 c.p. for emulsions containing 3% and 9% emulsifying agent respectively. Factors such as volume of internal phase, Composition of the internal phase, type and level of the emulsifying can affect physical properties and stability of emulsions.

**P-11 Development of Topical Gel for immunosuppressant Drug.** C. Medina, E.S. Ghaly, A. Novo, A. Elías: School of Pharmacy, Odontology School, Medical Sciences Campus, University of Puerto Rico.

Semisolid systems as gel are considered suitable vehicles for drug, since applied gels are non-toxic, easily removed and their composition can vary to achieve desired properties. The objectives of this study are to evaluate the rheological properties, pH and physical properties of different gel formulations. Gels containing different

polymers: protanal, carbopol 934, polyethylene oxide, hydroxypropyl cellulose and different levels of polymer: 2.5% w/v, 5, 7.5 and 10% w/v were prepared by mixing the polymer with distilled water using Dyna mixer at 5-6 rpm until uniform dispersions are obtained. Additional systems containing 10% mixture of two polymers were prepared: protanal: carbopol; protanal:polyethylene oxide, protanal: hydroxy-propyl cellulose at ratios of 1:1, 1:3 and 3:1. Stability was performed for four months at 4 to 6°C and the most stable formulations were evaluated at 37°C for twenty days. The results obtained indicated that all gel formulations containing single polymer at 10% w/v level and combined polymers of protanal:carbopol at 1:1 ratio have viscosities ranged from 52,000 C.P. to 777,000 C.P. The pH values were 2.72 for Carbopol and 8.84 for polyethylene oxide systems. Low pH systems were adjusted by adding small amount of 0.01 M NaOH. All gel systems containing 10% w/v were stable at 37°C for 10 days. However those gels composed of protanal were not stable at 4-6°C after one month. It can be concluded that 10% polymer level is the best for all systems containing single polymer except for gels containing ethylene oxide, the best level was 20% w/v. Also, gels composed of combinations of two polymers(1:1) and at 10% level appear to be stable and ave suitable physical properties. Gels physical properties appears to depend on type, level and ratio of one polymer to the other.

**P-12 Physicochemical Characterization of Glipizide, Crystal Properties and Polymorphs.** J. Bernard, E.S. Ghaly: School of Pharmacy, Medical Sciences, Campus, University of Puerto Rico.

It has been recognized that different crystal structures or polymorphs forms of a given chemical entity might exhibit different solubility, electrical properties, density, stability and bioavailability. The objectives of this study are to determine if glipizide drug has more than one crystalline form (polymorphs) and to use the X-ray diffraction, Nucleomagnetic resonance (NMR) and differential scanning calorimetry (DSC) to detect the different crystal forms. Also, to characterize the physical properties of the different crystals such as particle size using scanning electron microscope (SEM) and the solubility of the different forms of glipizide. The drug glipizide was stored at different temperatures (40 °C, 50 and 70 °C.) and at different time intervals, samples were analyzed using DSC, NMR, X-ray diffraction, SEM and were tested for solubility. The second stage of this research included re-crystallization of the drug using different organic solvents

such as acetone, ethanol, methanol and mixture of ethanol-methanol and finally the effect of temperature on the re-crystallized glipizide was evaluated. The solubility of all crystal forms were evaluated in a simulated intestinal fluid (pH 7.4) at 37°C. The DSC thermograms showed transition behavior of the re-crystallized forms of glipizide prepared by using different solvents. The melting range of the different re-crystallized forms was between 155 °C and 210 °C. The enthalpies at 51.33 °C were: 57.49 X 10<sup>-3</sup> m J mol<sup>-1</sup> (glipizide powder); 85.31 X 10<sup>-3</sup> m J mol<sup>-1</sup> (re-crystallized with acetone); 83.32 X 10<sup>-3</sup> m J mol<sup>-1</sup> (re-crystallized with methanol) and 68.05 X 10<sup>-3</sup> m J mol<sup>-1</sup>. This study showed that glipizide can exists in different crystal forms which are different in solubility and bioavailability.

**P-13 Malignant Histiocytosis Presenting as Atypical Guillain-Barré Syndrome.** M. Quintero, L. Colón, Department of Pathology UPR School of Medicine.

Malignant histiocytosis is a rare, severe, and rapidly progressive fatal disorder characterized by systemic proliferation of abnormal histiocytic cells; rarely involving the central nervous system. We report a case of a fifty-nine year old female who presented with areflexia, leg weakness, cervical pain, absence of fever, cranial nerve involvement, (bilateral weakness of facial muscles) and elevated concentration of protein in cerebrospinal fluid. Head CT scan and cerebrospinal fluid cultures were negative and a diagnosis of atypical Guillain-Barré was established. Despite immunoglobulin therapy the patient died three weeks after the initial symptoms. Autopsy revealed infiltration of leptomeninges, spinal cord nerve roots, and perihilar lymph nodes by cells histologically and immunohistochemically consistent with malignant histiocytes. This is an extremely rare case of malignant histiocytosis presenting leptomeningeal and nervous system involvement as a polyradiculoneural syndrome.

**P-14 Improved Predicted-Adult Height in a Cohort of Gils Treated with Gonadotropin-Releasing Hormone Analogue.** O. Lliteras-Colón, MD, F. Nieves-Rivera, MD, L. González -Pijem, MD, Dept. of Pediatrics, Med School.

INTRODUCTION: Adult height in girls is most frequently attained by the time menarche appears. The appropriate age for medical intervention to halt secondary sexual characteristics development and menarche has recently



become into question. In particular, lowering the chronological age, as a diagnostic criteria for precocious puberty, has been proposed by some authors. Herein we present our experience in a cohort of girls with proven premature activation of hypothalamic-pituitary-gonadal axis (ascertained by Gonadorelin stimulation test) who were treated with gonadotropin-releasing hormone analogue (GnRH).

**METHODS:** A cohort of 9 girls with central precocious puberty with ages 6.6/11.8 (mean  $\pm$ SD, 8.2  $\pm$  1.6) were treated with GnRH for 1-3 years. Their bone ages (BA) were assessed according to the method of Greulich and Pyle. Predicted height was estimated based on the Bayley-Pinneau tables. All of them had reached their adult heights as determined by deceleration of growth and BA  $\geq$  15 years. Standard deviation score (Z-score) for height at the beginning of therapy was compared against Z-score attained at adult height. Adult height Z-score was also compared against the predicted-adult-height Z-score at the beginning of GnRH. **RESULTS:** Z-score for adult height was significantly improved when compared to their predicted-adult-height Z-score at initiation of therapy (-0.8  $\pm$  1.2 vs -1.2  $\pm$  1.9;  $p < 0.05$ ). Z-score for adult height was significantly different when compared to their Z-score for height at initiation of GnRH and below it (-0.8  $\pm$  1.2 vs -0.67  $\pm$  2.3;  $p < 0.05$ ). **SUMMARY:** We found an improved adult height among the GnRH treated cohort with central precocious puberty when compared to their predicted-adult-height at the time therapy was started. However, adult height Z-score attained remained below the Z-score for height at the beginning of therapy. **CONCLUSION:** GnRH treatment improved predicted-adult stature in a cohort of girls with demonstrated premature activation of hypothalamic-pituitary-gonadal axis compared to what Bayley-Pinneau table would have predicted. Medical intervention precluded further growth deficit in this treated cohort.

**P-15** **Special Pediatric Dentistry Course: Evaluation of Dental Treatment Performed Under General Anesthesia (1997-1999).** Machuca, C., Hanke, Rosana, Lopez, Lydia, Velazquez-Quintana, Yvette, Machuca, Guillermo, Bullon, Pedro. (University of Puerto Rico School of Dentistry).

**Purpose:**

Under general anesthesia in a special pediatric group we compared the treatment received by mentally retarded patients to that received by non-mentally retarded patients.

**Abstract:** A sample of 57 hospital records of patients

treated at the Special Pediatric Course at the Puerto Rico Pediatric Hospital, were reviewed. The sampling represented 65% of the patients from whom the information was available. All patients were treated under general anesthesia by pediatric dentistry residents, during the period 1997-1999. Statistical analysis was done using the chi-square test for inferences on proportions. Results were considered statistically significant when  $p$  values were under 0.005. Results: Mental Retardation (MR) made up 69.7% and non-mentally retarded patients (NMR) made up 39.3% of the sample studied. Ages ranged from 2 to 35 years with a mean age 11 (SD=8.54). Thirty-eight (66.7%) were under 12 years (95% of NMR and 47% of MR). Thirty-five percent were between ages 17 and 35, 60.9% were female. There was a statistically significant difference regarding the age groups and MR ( $p < 0.01$ ). The MRs were classified into seven categories: MR (32.3%), cerebral palsy (12.9%), epileptic (6.5%), mental syndromes (32.3%), hydrocephalic (6.5%), autism (6.5%) and others (3.2%). The NMR were classified into 6 categories: BBT (66.7%), cardiac patients (8.3%), maxillofacial anomalies (4.2%), organic syndromes (12.5%) and others (8.3%). The dental procedures performed were: dental extractions 84% (MR) and 68% (NMR), restorative procedures 87.3% (MR) and 12.7% (NMR). There was statistically significant difference regarding resin procedures ( $p < 0.025$ ). Oral prophylaxis was performed in 76.8%, sealants in 10.7% and topical fluoride in 21.8%. **Conclusion:** Dental extraction was a frequently performed procedure in both groups. The prevalence of exodontia and restorative procedures indicates the need to design and implement primary prevention programs for all special patients.

**P-16** **Bonding Strength of Two Resin Modified Glass Ionomer Cement Systems.** Ruiz, N., Perry, R., Dougherty, E., Psoter, W. School of Dentistry, University of Puerto Rico

**Abstract:** Little information is available on the adhesion between ceramometal alloys and various types of glass ionomer cements. The objective of this in vitro study was to evaluate the bonding strength of metal buttons cemented by a new resin modified glass ionomer cement (RelyX Luting Cement, 3M) and an established resin modified glass ionomer cement (ProTecCem, Vivadent) to tooth structure. A clinical situation for bonding a crown or inlay to a tooth was simulated. The bonding strength of these cements was compared to a control glass ionomer cement (Ketac Cem). The three products were randomly assigned and cemented on extracted posterior teeth (10

per group). The occlusal surface of each specimen was grounded flat to expose dentin. Metallic buttons made of Rexillium were bonded to the middle of the exposed dentin surfaces, according to the manufacturer instructions. After storing the specimen in a humidity controlled oven and thermocycling (in water 500 cycles over 24 hours), tensile strength was measured using an Instron machine. Three specimens were excluded due to fractures following thermocycling. Mean tensile strength were; Rely X = 0.566 MPa (s.d.=0.343) (n=9); Pro Tec Cem = 0.345 MPa (s.d.=0.336) (n=8); Ketac Cem = 0.814 MPa (s.d. 0.843) (n=10). No statistically significant difference was demonstrated by General Linear Models analysis (p=0.253). These results may however be a function of the wide variability of the controls and small sample size. The control (Ketac Cem) had the highest mean tensile strength.

**P-17** **An Evaluation of a Resin System as an Alternative to Porcelain Restorations Using a CAD-CAM Machine.** Ortiz, Ramón\*, Dr. Edward Combe, Dr. Carlos Toro, School of Dentistry, University of Puerto Rico.

The CAD CAM technique is a computer assisted design, computer aided manufacture procedure that uses different materials to make dental restorations. The objectives of this study were to compare the hardness, crack propagation, surface roughness of a new experimental resin, two porcelains and two resins used in indirect technique and measure the lifetime of the Cerec2 tools, using two ceramics systems and an experimental resin. Vickers hardness was measured using a 1kg load and 15s load time. Crack propagation was observed microscopically following hardness measurement. Surface roughness was measured with SEM. Statistically significant differences were found between the experimental resin and the other material, in hardness, crack propagation and surface roughness (P<.05). The experimental resin was superior in hardness to the two resins, and was inferior in relation to the two porcelains. The surface and crack propagation of the experimental material was superior in comparison to the two porcelains. The wheel lifetime was greater for the Paradigm (experimental material) than for the two porcelains, and the resins. This new material improves the lifetime of the Cerec 2 tools making the system more cost effective, and accessible to the dental profession. It offers an additional resin system with improved physical and mechanical properties, presenting no cracks with an acceptable hardness.

**P-18** **Effect of Chlorhexidine and Carbamide Peroxide on Dentin Bond Strength.** Perry R.D., Santiago J.J.\* (Tufts University). (University of Puerto Rico).

**Abstract:** Carbamide peroxide bleaching and chlorhexidine gluconate may adversely affect the bond strength of composite to dentin. The purpose of this study was to investigate the effect of 16% carbamide peroxide and 2% chlorhexidine gluconate on the shear bond strength of composite to dentin using a non-rinse etched dental bonding agent. Specimens were randomly assigned to one of three groups (n=12 for each group): (1) 16% carbamide peroxide bleach [bleached 7 hr/day for five consecutive days], (2) 2% chlorhexidine gluconate [soaked continuously for 5 days] and (3) 0.9% saline solution [soaked continuously for 5 days] as the control group. Cylinders of composite were bonded to dentin of each treated tooth using the ESPE L-POP bonding agent. Specimens were stored for 1 day in water, thermocycled (500 cycles between 5 C to 55 C). The shear strength was determined with an Instron universal testing machine at a crosshead speed of 0.5 mm/min. The mean shear bond strength values were as follows: 14.50 N (s.d.=3.06) for the bleach group, 12.21 N (s.d.=3.59) for the chlorhexidine group, 12.35 N (s.d.=3.60) for the control group. One-way ANOVA revealed that neither the carbamide peroxide nor the chlorhexidine significantly affected the shear bond strength of composite to dentin when compared to control (p=.20).

**P-19** **Pertinencia del Curso Clínico de Práctica Privada Simulada en la Práctica Profesional de los Egresados de la Escuela de Odontología 1996-2000.** C. Claudio, C. Quintero, A. López\*, A. Elías (U.P.R., R.C.M.)

El curso clínico de Práctica Privada Simulada (TEAM) pretende capacitar a los estudiantes en el manejo y administración efectiva de una práctica dental. Este curso ha experimentado una serie de cambios curriculares con el fin de atemperarlo a la realidad de la práctica de la profesión en P.R. El propósito de esta encuesta fue determinar la pertinencia de este curso en la práctica de la profesión de los egresados de la Escuela de Odontología de 1996-2000. El cuestionario utilizado fue desarrollado siguiendo los objetivos específicos del curso y fue validado en un estudio piloto. El cuestionario consistió de seis preguntas cerradas y una abierta. Dicho cuestionario fue administrado vía telefónica por una entrevistadora externa al programa. A cada uno de los

sujetos se le explicó el propósito de la encuesta, se le indicó el número de preguntas y el tiempo aproximado de la encuesta. Se le explicó además que su participación era voluntaria, anónima y podía retirarse o no contestar alguna pregunta. La muestra fue seleccionada aleatoriamente entre los egresados de las clases antes mencionadas. De un total de 225 egresados, la muestra quedó compuesta por 40 sujetos dos de los cuales no contestaron la encuesta. Los 38 restantes se dividieron en 22 mujeres y 16 hombres. Entre los resultados más sobresalientes se encuentra que la totalidad de los encuestados indicó estar de acuerdo en que el curso contribuyó mucho o completamente al desarrollo de sus destrezas en las áreas de itinerario de trabajo, análisis de producción, delegación de tareas, utilización de múltiples sillas y manejo de práctica. Un 94% igualmente indicó que el curso le había ayudado en las áreas de supervisión de personal, toma de decisiones, obtener seguridad y rapidez, practicar su estilo de liderazgo y en la administración y supervisión de la práctica. El 87% indicó que el curso le ayudó en el manejo de pacientes y personal, la fase administrativa de la práctica, y en la capacidad para adaptarse a diversas situaciones. Los resultados de este estudio son congruentes a los obtenidos en estudios realizados anteriormente por Sojo(1987) y Reyes et al. (1996) donde el 94% de los encuestados indicó que el curso le ayudó en su capacidad para adaptarse a diferentes situaciones, a un 76% lo ayudó a desarrollar sus conocimientos de administración y a sobre un 69% lo ayudó en el desarrollo de destrezas de supervisión, manejo de situaciones imprevistas, toma de decisiones y estilo de liderazgo. Podemos concluir que las experiencias clínicas y administrativas ofrecidas en el curso han sido positivas para el logro de una práctica privada exitosa. Partiendo de los resultados de este estudio, se recomienda: la ampliación del tiempo de rotación, ofrecer esta experiencia como pasantía clínica a estudiantes de universidades extranjeras y que la experiencia sirva como ejercicio para medir el nivel de competencia de nuestros estudiantes en la administración efectiva de una práctica privada.

**P-20 Parental Perception of Developmental Deficiencies in High Risk Neonates at Nine and Fifteen Months.** K Pratts MD, L García MD, I García MD, S Deynes, N Zambrana, L Martínez, M Valcarcel MD. UPR School of Medicine, Department of Pediatrics, Neonatology Section. San Juan, PR

**Background:** With advances in the neonatal and perinatal care over the past two decades, there has been a dramatic

improvement in the survival of high risk newborns. These infants are at risk for developmental problems. Early identification has been encouraged to prevent or minimize disabilities through appropriate interventions. **Methods:** We analyzed neonatal data obtained during NICU hospitalization, neurodevelopmental evaluations from High Risk Clinics, and from maternal interview when the infant was 9 and 15 months of age to assess family perception of infant development. **Results:** A total of 89 families were interviewed at 9 month old, and 60 families at 15 months of age of the NICU survivor. At 9 month old, 12% of the parents thought that their baby had motor problems, 1% complained of a language deficiency, and none mentioned hearing loss as a problem. In contrast, the findings at the clinics showed that 47% had gross motor problems, 27% language deficiency, and 14% hearing loss. At the 15 month old interview, 15% referred motor problems in their baby, 3% language deficiency, and 2% hearing impairment. Again, there was a significant difference with clinics findings where 41% had gross motor problems, 41% language deficiency, and 12% hearing impairment. **Conclusions:** There is a significant difference between parental perception of developmental deficiencies versus the actual findings of patients affected in one or more development areas. These findings create great concern in the medical community in charge of the follow-up of these patients, since early identification of the deficiencies leads to earlier intervention so as to develop patient's full potential and reduce the long term sequelae of NICU survivors. *This project is funded in part by the State Council for Developmental Deficiencies.*

**P-21 Rhythmic Fluctuations of Systolic Blood Pressure During the Estrous Cycle in Rats.** J. González-Pérez, M.J. Crespo\* and A.C. Segarra\*\*. Departments of Biology, University of Puerto Rico, Río Piedras, Pharmacology\* and Physiology,\*\* University of Puerto Rico, School of Medicine, San Juan, Puerto Rico 00936

Epidemiological studies have established a protective role for estrogen on the cardiovascular system of premenopausal women. However, no correlation has been established between plasma estrogen (E) levels and endogenous modulators of the arterial wall. Female Sprague-Dawley rats during different stages of the estrous cycle were used. Rats were classified as diestrous DE, lowest E, n=11, proestrus (PE, highest E, n=19) or estrus (ES, intermediate E, n=10) by histological examination of a vaginal smear. Systolic blood pressure



(BP), nitric oxide levels (NO) and angiotensin-converting enzyme (ACE)-activity in the aorta, plasma and the Herat were determined and correlated. Our results showed a strong negative correlation between E levels and BP: PE:  $113 \pm 3.3$  mmHg, ES:  $125.5 \pm 7.1$  mmHg and DE:  $142.4 \pm 6.6$  mmHg ( $P < 0.05$  between DE and PE groups). In contrast, plasmatic NO concentrations were found to be positively correlated with E levels. ACE-activity value in the aorta was significantly higher during PE than DE phase ( $0.684 \pm 0.095$  vs.  $0.375 \pm 0.74$  nM/mg tissue x min, respectively,  $P < 0.05$ ). No differences in ACE-activity values were observed in plasma and Herat during the estrous cycle. Our data points to a strong correlation between increased endogenous E levels, low BP and increased NO concentration during the normal estrous cycle. These results suggest that the cardiovascular system is modulated by estrogen fluctuations during the estrous cycle in rats. This work was partially supported by NIH-RISE program of the MSC-UPR and NIH-RCMI Grant RR-03051.

**P-22** **Expression of the *mdr1* genes of the rodent malaria *Plasmodium yoelii* and *Plasmodium berghei*.** Iván Ferrer-Rodríguez, José Pérez-Rosado, Gary W. Gervais, Vivian C. Villegas, and Adelfa E. Serrano. Department of Microbiology and Medical Zoology, University of Puerto Rico School of Medicine, San Juan, Puerto Rico.

The rodent species, *P. yoelii* and *P. berghei*, are excellent model systems for the study of the mechanisms of drug action and drug resistance in malaria. In our laboratory we are currently investigating the putative relationship between the *mdr1* gene of both parasites and multidrug resistance. It is known that in *P. falciparum*, multidrug resistance to antimalarials is associated with amplifications and point mutations of the parasite *pfmdr1*. We had previously reported an apparent amplification of the *P. berghei pbmdr1* gene associated with mefloquine resistance, as well as amplification of the *P. yoelii pymdr1* gene associated with artemisinin resistance. We now report the results of expression studies in both of these species. Expression was analyzed by immunofluorescence, Western blot, RT-PCR, and ribonuclease protection assays (RPA). A monospecific polyclonal antibody recognized *P. yoelii* and *P. berghei* polypeptides of approximately 150-kDa by Western Blot. The protein is detected throughout the intraerythrocytic cycle in both species. Determination of the gene expression levels in drug sensitive and drug resistant strains of both rodent malaria species are currently in progress.

**P-23** **Cardiovascular Deterioration in STZ-diabetic Rats: Possible Role of Vascular ACE.** Moreta S, Rios A, Quidgley J, Gonzalez J,\* Vargas I, and Crespo MJ. Departments of Pharmacology and \*Emergency Medicine University of Puerto Rico, School of Medicine, San Juan, Puerto Rico 00936

Vascular disease is one of the leading causes of morbidity and mortality in diabetic patients. The precise mechanisms involved, however, remain undefined. To evaluate the role of the renin-angiotensin system (RAS) in the development of vascular alterations in this disease, vascular angiotensin converting enzyme (ACE) activity, endothelial-dependent relaxation, and cardiac output index were assessed in streptozotocin (STZ)-diabetic rats at 2 and 4 weeks following the induction of diabetes. Age-matched Sprague-Dawley rats were used as controls. ACE activity in aortic homogenates was 2 times higher in rats at 2 weeks following diabetic induction than in controls ( $0.46 \pm 0.06$  vs.  $0.19 \pm 0.02$  nmol/mg x min,  $n=8$ ,  $P < 0.05$ ). In contrast, no difference in vascular ACE activity was observed between rats at 4 weeks following diabetic induction ( $0.20 \pm 0.05$  nmol/mg x min) and controls, ( $n=8$ ,  $P > 0.05$ ). These results were observed simultaneously with impaired endothelial function. The maximal relaxation achieved in aortic rings with 10 mM Ach was reduced by 38% in rats after 2 weeks of diabetes and by 41% after 4 weeks of diabetes ( $n=8$ ,  $P < 0.05$ ). However,  $EC_{50}$  values for the Ach-induced relaxation were similar ( $1.78 \pm 0.3$  for controls;  $0.86 \pm 0.6$  at 2 weeks and  $1.72 \pm 0.5$  nM at 4 weeks for diabetics). Two weeks following diabetic induction, the cardiac output index decreased by 16%, and after 4 weeks by 30% ( $n=4$ ,  $p < 0.05$ ). These results together suggest an important role of the local RAS in the genesis of vascular dysfunction and cardiac deterioration within the first stages of diabetes. Endothelial dysfunction and high vascular ACE activity may promote progressive deterioration of the cardiovascular system in STZ-diabetic rats from the earliest stages by increasing peripheral resistance, preload, afterload, and cardiac work. Supported by RCMI grant RR-03051(NIH).

**P-24** **Adolescent Mothers and Neonatal Mortality in a High Risk Setting.** N Ortiz MD, M Rivera I, J González, I García MD, L García MD, M Valcarcel MD. UPR School of Medicine, Department of Pediatrics, Neonatology Section. San Juan, PR.

**Background:** Pregnancy rates among US female adolescents are among the highest in the industrialized

world. In Puerto Rico, 20% of live births are from adolescent mothers. These mothers are more likely to give birth to underweight infants who consequently have a greater mortality. Many social factors have been associated with poor birth outcome and mortality including poverty, lack of access to health care, low educational level, and inadequate prenatal care. The objective of this report is to assess perinatal complications and neonatal mortality in adolescent mothers. Access to health care was also analyzed. **Methods:** Medical records of 161 neonates admitted to a neonatal intensive care unit during a one year period were reviewed to identify adolescent mothers. Mortality rate, mode of delivery, and access to health care were assessed. Data was analyzed using Pearson's chi-square and frequency distribution. A *p* value less than 0.05 was considered statistically significant. **Results:** In the studied sample, 26% of the mothers were adolescents which is similar to the percentage of adolescent births in the island. In this high risk setting, no association was found between being an adolescent mother and mode of delivery or neonatal mortality when compared to non-adolescent mothers. These adolescent mothers were more likely to have a delivery by Cesarean section than adolescent mothers in the island (44% vs 14%,  $p=0.0000$ ). Their babies were also more likely to die during the neonatal period (17% vs 1%,  $p=0.0000$ ). All adolescent mothers in this group had medical insurance, 95% of them the one offered by the government. **Conclusions:** Being an adolescent mother giving birth in a high risk center correlates with increased possibilities of giving birth by Cesarean section and to experience a neonatal death. This group of adolescents referred to high risk centers due to maternal or fetal medical problems may need stronger support during pregnancy and after delivery since they are more likely to experience delivery complications and have to face a neonatal death.

**P-25 Respiratory Syncytial Virus Prophylaxis with Palivizumab: the Puerto Rico Experience- a Preliminary Report.** L Winchester, M Vizcarrondo, L García, I GarcíaA, CB Concepción. UPR School of Medicine, Department of Pediatrics, Neonatology Section. San Juan, Puerto Rico.

**Background:** Respiratory syncytial virus (RSV) infections are associated with a high mortality in children. Babies born prematurely, with multiple congenital anomalies, chronic lung disease, and certain immunodeficiencies are at higher risk of acquiring this infection. In Puerto Rico,

RSV infections are more prominent from August to December. Prevention of RSV infection is now available with palivizumab (Synagys), a humanized monoclonal antibody, which is now recommended by the American Academy of Pediatrics (AAP). In Puerto Rico, palivizumab has been available since 1999. The objective of this report is to describe the use of palivizumab since its availability in Puerto Rico. **Methods:** Data from the 2000 season was collected from the vaccination clinic and that from the 1999 season from the vaccination report. **Results:** A total of 80 patients admitted to our neonatal services were referred for RSV prophylaxis during the 1999 season. A total of 163 patients met the criteria for prophylaxis during the 2000 season. The mean birth weight of the 2000 season infants was 1343 grams and the mean gestational age was 30 weeks. During 2000 seventy-five infants received at least one dose of the maximum 5 doses recommended. This represents 46% of the candidates. **Conclusions:** Although more infants received RSV prophylaxis during the 2<sup>nd</sup> season of palivizumab use in Puerto Rico, the rate of prophylaxis is still low despite the AAP recommendation and the availability of the product. Possible explanations include: lack of awareness of the medical community, the medical insurance companies, and the parents of the importance of RSV prophylaxis; and high cost of the medication.

**P-26 Pulmonary Adenocarcinoma with Associated Sarcoid Reaction: Report of a Case.** Morales-Melecio, Ilia, MD ; Colon-Castillo, Lillian, MD

A 56 year-old female was admitted to our institution due to lower back trauma with associated pain and progressive leg weakness, numbness and uncontrolled movements. A computed tomogram showed a lytic lesion at the T-8 level. She was taken to the operating room and a bone graft with fusion of several vertebrae was performed. The pathology report revealed an undifferentiated carcinoma. The patient died several weeks later and at the autopsy, there was a poorly differentiated adenocarcinoma of the lung that was widely metastatic. There were sarcoid reactions in the lung parenchyma, however, no signs of systemic sarcoidosis were evident. There have been few reports on the coexistence of sarcoidosis and lung cancer, and the relationship between the two diseases is unclear, although it has been postulated that it may be a local immune response to the cancer cells.

**P-27** **Forty three year old female with Recurrent Ulcers and Uncontrolled Seizures.** J.M. González, J.M. Rodríguez, E.J. González, A. De Jesús. University of Puerto Rico School of Medicine, San Juan, Puerto Rico.

A 43 years-old female was admitted to the medical ward due to arthralgia, skin lesions, headaches, and seizures. The seizures episodes had been increasing in frequency during the past eight months. Past medical history is relevant for headaches and bronchial asthma. Medications at the time of admission included phenobarbital, folic acid, acetaminophen with codeine, and phenytoin. Upon further questioning, the patient referred having a history of recurrent lingual and buccal mucosa ulcers, occurring at least three times during the last year, occasional transient joint pain including wrists, lower back, knees, and ankles. She referred transient episodes of conjunctival erythema, diplopia, and photosensitivity. Patient also reports having had one episode of genital ulcers six weeks prior to admission. Physical examination revealed a well nourished and groomed patient. Two shallow ulcers were found at the tongue. A pustular lesion with an erythematous base was found on the right wrist. On the right arm there were noted two subcutaneous nodules at previous venipuncture sites. Several scattered non-blanching erythematous papules could be observed on the pre-tibial aspect of both legs. One genital ulcer was evidenced. The rest of the physical examination findings were within normal limits. Serum chemistry revealed no electrolytic disturbances and no abnormalities of renal, hepatic, or thyroid function. There was no leukocytosis, leucopenia, or thrombocytopenia. A normochromic, normocytic anemia was found, as well as thrombocytosis. Erythrocyte sedimentation rate was increased. Lupus panel was negative, as well as the lupus anticoagulant profile. C3 and C4 complement levels and coagulation parameters were within normal limits. The following test were negative: P-ANCA, C-ANCA, and antiphosphatidylserine antibodies. Punch skin biopsy from a pre-tibial area lesion showed a neutrophilic vasculitis with luminal thrombosis. MRI/MRA of the head was non suggestive of vasculitic process. Tzanck smear was negative. The patient continued with her anticonvulsant therapy and prednisone was started at 20 mg PO qd. In addition iron supplementation was given. Behcet's syndrome is distinguished by recurrent attacks of oral and genital ulcerations as well as ocular involvement, often with arthritis. Central nervous involvement can occur. The prevalence of Behcet's syndrome has been reported to be 1:500,000 in North America.

**P-28** **Adolescent Pregnancies and Low Birth Weight in a NICU Setting.** J. González<sup>1</sup>, M. Rivera<sup>1</sup>, C. Ortiz<sup>1</sup>, N. ortiz MD<sup>2</sup>, L. García MD<sup>3</sup>, M. Valcarcel MD<sup>3</sup>. UPR School of Medicine<sup>1</sup>, Department of Pediatrics<sup>2</sup>, Neonatology Section<sup>3</sup>, San Juan, Puerto Rico.

**Background:** It has been widely reported that adolescent mothers are more likely to experience poor pregnancy outcomes, especially low birth weight (LBW) and/or premature infants. The purpose of this study is to examine the incidence of low birth weight (LBW) and very low birth weight (VLBW) neonates which were delivered by adolescent mothers and admitted to the Neonatal Intensive Care Unit (NICU) of the University Pediatric Hospital. The latter population was compared to the total of neonates delivered by adolescent mothers in Puerto Rico. **Methods:** Medical records of 161 neonates admitted to NICU during a one year period were evaluated. Demographic data of the adolescent pregnancies in Puerto Rico was obtained from the latest vital statistic record released by the P.R. Department of Health. Statistical analysis was done using Pearson's Chi-Square and frequency distribution. A p value less than or equal to 0.05 was considered statistically significant. **Results:** A total of 41 neonates were delivered by adolescent mothers. Of these neonates 32 % were LBW and 61 % were VLBW. The demographic data for P.R. revealed that 10.1 % of neonates delivered by adolescent were LBW and 1.6 % were VLBW. NICU adolescent mother reflected a significant higher incidence of LBW ( $p = 0.000$ ) and VLBW ( $p = 0.000$ ) neonates when compared to the general adolescent population of P.R. **Conclusion:** A significant higher incidence of LBW and VLBW neonates was found in this group of adolescent giving birth in a high risk setting when compared to adolescents in the island. Evaluation of these adolescent mothers may provide a better understanding of the risk factors for poor prenatal outcome.

**P-29** **Clinical Course of a Pre Term Baby Born from a Mother with Hemophagocytic Syndrome.** Luis M. Rodríguez MD, Inés Garcia MD, Pedro J Santiago MD, Marta Valcarcel MD-Neonatology Section and Hematology Section, Department of Pediatrics, University of Puerto Rico School of Medicine

**Background:** Hemophagocytic syndrome is characterized by nonmalignant histiocytes that undergo uncontrolled phagocytosis of normal hematopoietic cells. It can cause

clinical manifestations such as cytopenia, hemophagocytosis, hypofibrinogenemia and hepatosplenomegaly. It can be the result of viral, bacterial, parasitic infections and malignancy. Outcome is highly variable. There is no report about the outcome of a newborn delivered from a mother affected with hemophagocytic syndrome. **Case:** A baby girl pre term was born at 28 weeks gestational age with a birth weight of 846 grams. The mother had history of four episodes of left leg thrombophlebitis in the last four years and evidence of elevated anticardiolipin IgG in serum. One month prior to labor she had a viral syndrome, which required hospitalization due to thrombocytopenia. She was discharged and readmitted due to respiratory distress, high blood pressure and thrombocytopenia. A cesarean section was performed due to suspected preclampsia and HELLP syndrome. Afterwards a bone marrow showed hemophagocytic syndrome in the mother. The neonate had respiratory depression at birth requiring mechanical ventilation for 24 hours. Oxygen was discontinued four days later. Since birth she had thrombocytopenia, leukopenia, hypofibrinogenemia, elevated anticardiolipin IgG in serum, prolonged thrombin and partial thromboplastin time. She required multiple transfusions of platelets, fresh frozen plasma and immunoglobulins. During the first two weeks of life the hematological findings normalized. **Conclusion:** This newborn had several hematological derangements except for anemia. Newborn from mothers with hemophagocytic syndrome may present cytopenia and coagulation disorders which require aggressive management. Although the pathogenesis is not well-understood findings in this baby suggest that the trigger factor for the hemophagocytic syndrome may cross the placenta and affect the newborn.

**P-30** **Breast Cancer and Screening Knowledge among Physicians in Puerto Rico.** M. Sánchez Ayéndez; C.M. Nazario; N. Figueroa; A.L. Dávila, M. Bustillo, M.C. Larruiz; G. Martínez. School of Public Health, University of Puerto Rico.

A focus group was conducted among a group of physician to obtain qualitative data about knowledge and compliance with breast cancer screening guidelines. Mammography for low-income and minority women is an important intervention issue as it is still under-used by minority and low-income women. The results discussed hereinafter pertain to the first phase of a larger study funded by DoDBCRP that focuses on compliance with

the screening guidelines among low-income middle-aged women in Puerto Rico. The main objective of the focus group was to obtain qualitative data about the appropriateness of an instrument of semi-structured and open-ended questions with the simulation of case studies to obtain the factors that explain screening mammogram referral patterns and knowledge about screening guidelines (NIH Consensus, 1997) among physicians in different clinical settings. In general terms, the focus group helped us identify areas where the instrument needed improvement while minimizing bias (desirability). The group did not consider the instrument too long, too time consuming, or that any case studies had to be eliminated. They discussed the case studies and agreed that some were more difficult to answer than others. It was clear from the focus group that referral patterns vary according to the medical practice and clinical setting, and with patients' characteristics. The issues of cost, cost-effectiveness, capitation and type of health insurance were a major concern for most of the participants. Such issues are probably modifying the way physicians are following the referral guidelines for breast cancer screening mammograms. The group commented on the difficulties that physicians are facing in practicing "good medicine" with such restrictions.

**P-31** **Identification of the Expression of the Insulin Receptor In Molt-4 T Cells by Flow Cytometry.** Y Gerena, J Meléndez, J De La Torre, A Schwartz and E Fernández-Repollet. Dept. of Pharmacology, UPR School of Medicine, San Juan, PR.

Cultured Molt-4 T cells are considered an adequate model for insulin receptor studies. Although the presence of the insulin receptor in Molt-4 T cells had been previously reported, there is no evidence for its detection by flow cytometry. The expression of the insulin receptor in Molt-4 T cells was investigated by examining the binding of FITC-labelled Insulin (Sigma Chemical, St. Louis, MO) and PE-labeled Insulin Receptor Antibody (BD PharMingen, San Diego, CA). Molt-4 T cells ( $1 \times 10^6$  cells) were suspended in staining buffer and incubated for up to 30 minutes at 4°C with the FITC-Insulin (30mg/ml) and the PE-Insulin Receptor Antibody (20ml/ $10^6$  cells). After incubation, the cells were washed twice in staining buffer, resuspended in ice cold PBS with subsequent fixation in a 0.5% paraformaldehyde solution and analyzed on a FACSsort flow cytometer (BDIS, San Jose, CA). Our data revealed a significant reduction in the fluorescence intensity of Insulin-FITC (>58%) and PE-Insulin Receptor

Antibody (>40%) after washing the cells twice with staining buffer. Validation of the effectiveness of these reagents on T lymphocytes from normal donors demonstrated a significant reduction in the fluorescence intensity of FITC-Insulin (>30%) and PE-Insulin Receptor Antibody (>44%). Competitive binding experiments between PE-Insulin Receptor Antibody and increasing concentrations of unlabelled insulin ( $10^{-8}$ - $10^{-4}$ M) showed specificity of the antibody for the insulin receptor in Molt-4 T cells but lower affinity than the unlabelled insulin. Taken together, these data demonstrate that detection of the insulin receptor by flow cytometry is not feasible due to the variations in binding of commercially available fluorescent insulin and the antibodies against the receptor. Studies are in progress to confirm the presence of the insulin receptor in Molt-4 T cells by Western Blot Analysis. Supported in part by RCMI Grant No. 612-RR-03051 and NIH Grant No. 1-F31-DK10188-01.

**P-32 Preliminary Characterization of the Dihydroorotase from the Protozoan Parasite *Toxoplasma gondii*.** S. M. Robles López and B. H. Zimmermann, Department of Biochemistry, University of Puerto Rico School of Medicine.

Dihydroorotase (DHOase) is the third enzyme of the pyrimidine biosynthetic pathway, and catalyzes the interconversion of carbamyl aspartate and dihydroorotate. We intend to do a biochemical characterization of this enzyme cloned from the parasite *Toxoplasma gondii*. This protozoan causes a serious infection, potentially lethal to immunocompromised individuals and to the fetus. In AIDS patients, *T. gondii* is the main cause of central nervous system infections (Luft and Remington, 1992). A DHOase clone was isolated from a *T. gondii* cDNA library by complementation of a DHOase deficient *E. coli* strain. A recombinant protein was expressed in *E. coli* using the overexpression vector pBAce (Craig, 1991). A purification scheme based on the method described by Zimmermann and Evans (1993), gave a yield of 23 mg of protein per liter of cell culture. The clone was sequenced on both strands by the dye terminator method. Predicted amino acid sequence showed identity with known DHOases. Predicted molecular weight of the clone is 44.2 kDa and isoelectric point is 5.72 ([http://www.expasy.ch/tools/pi\\_tool.html](http://www.expasy.ch/tools/pi_tool.html)). Specific activity of the purified enzyme in the degradative direction was determined by the method of Prescott and Jones (1969), resulting in a value of 14.5 nmoles/min/ $\mu$ g of protein. There is a dependence of activity on pH, with peak

degradative activity at pH 7.6. Preliminarily,  $V_{max}$  was calculated to be 15.0 nmoles/min/ $\mu$ g (degradative) and  $K_m$  was calculated to be 61.0  $\mu$ M (degradative). Macromolecular crystallization trials are in progress and a prospective protein crystal (11 x 70  $\mu$ ) was obtained using 0.4 M Na/K tartrate. Zn content will be determined for the purified enzyme.

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**P-33 Susceptibility of trophoblasts to infection with HIV-1 primary isolates.** Contreras, R; Sanchez, Z; García, V; Arroyo, M; Sanchez, E and Meléndez-Guerrero, L. Department of Microbiology and Medical Zoology, University of Puerto Rico, School of Medicine and Department of Pharmacy, Universidad Nacional de Colombia.

A possible route of Human Immunodeficiency Virus Type-1 (HIV-1) vertical transmission suggests transplacental passage. Whether the trophoblasts can be infected by cell-free HIV-1 is still controversial. BeWo choriocarcinoma cell line was inoculated with HIV-1 to determine the ability of trophoblasts in supporting infection by several primary isolates with different tropisms. Dual tropic, R5 and X4 HIV-1 variants were inoculated to BeWo cells, and the infection was detected at days 1, 2, 4 and 7 post-infection (P.I) by nested PCR. All HIV-1 isolates infected trophoblasts. Viral DNA was detected for 48 hours with all isolates tested but only R5 and dual tropic isolates show a band at 72 hours, meaning that R5 virus genome remain longer inside the cells than the X4 genome. At day 7 P.I, there was no viral DNA with any of the viruses tested. Our results show that all HIV-1 primary isolates can penetrate into the trophoblasts, despite different viral tropisms. However, trophoblasts interfere with HIV replication of all isolates at a post-entry level. Restriction of HIV replication by trophoblasts could explain why vertical transmission occurs a very low levels. Nevertheless, the HIV-1 entry into trophoblasts could facilitate viral access to other placental cells, such as placental macrophages and eventually to the fetus.

**P-34** **“Apoyo Social en Adulto Puertorriqueño con Diagnóstico de Cáncer”**. Vigo, M. Universidad de Puerto Rico, Recinto de Ciencias Médicas, Decanato de Enfermería, Programa de Estudios Graduados.

La presente investigación consistió de un estudio descriptivo cuantitativo cuyo propósito fue medir el apoyo social percibido por adultos puertorriqueños entre las edades de 50-64 años con diagnósticos de cáncer. Se estudió una muestra de 50 participantes con distintos tipos de cáncer recibiendo tratamiento de radioterapia en el Hospital Oncológico de Río Piedras, durante el mes de abril de 2000. El instrumento utilizado fue el Cuestionario para Apoyo Social de Norbeck (NSSQ, 1995). El mismo midió propiedades funcionales (emocional, tangible), redes de apoyo (estabilidad, frecuencia de contactos y pérdidas recientes). La muestra estuvo constituida por 25 hombres (50%) y 25 mujeres (50%). El porcentaje mayor se encontraba casado (62%) y residiendo en el área metropolitana el 72% (n=36). La mediana de escolaridad fue de 12 años con un rango que fluctuó desde 0-19 años de estudio (34%, sd=6.82). En cuanto al renglón de empleo, el 44.9% (n=22) se encontraba desempleado. En la escala de apoyo social, el resultado más significativo se encontró entre las redes de apoyo donde la familia y parientes obtuvo un 88% con una percepción de apoyo moderado. Esta red fue seguida por esposo o pareja (62%) y en tercer lugar los amigos con un 34%. La confianza en la red obtuvo una puntuación promedio de 23.46 (sd=13.62). Los sentimientos de aprecio obtuvieron una puntuación promedio de 23.36 puntos (sd=13.45). El respeto y admiración percibido obtuvo una percepción moderada de 23.18 puntos (sd=13.54). Las acciones o modo de pensar alcanzaron un promedio de 22.72 puntos (sd=13.68), mientras que el nivel de ayuda fue de 21.92 puntos (sd=12.75). El tiempo promedio de conocer la red de apoyo fue de más de cinco años, mientras que la frecuencia mayor de contacto fluctuó entre semanal y diaria. El 68% (n=34) indicó que no había perdido una red de apoyo importante. La cantidad de apoyo percibido que más sobresalió fue “poca cantidad” con un 72%. Esto se debe a que la familia y parientes es menor que las demás redes. La familia y los parientes son la principal fuente de apoyo, sin embargo, la percepción de ese apoyo es una moderada y los agentes de salud no figuran como agentes de apoyo significativo.

**P-35** **Enhanced Efficacy of VLP Based DNA Prime/Protein Boost Immunization of Macaques Against Pathogenic SIV Using IL-12 and GM-CSF Adjuvants**. I. Martinez\*, Z. Israel, M. Sidhu, F. Villinger, A. Ansari, D. Montefiori, R. Stout, M. Martinez, A. Martinez, E. Suarez and E. Kraiselburd. \*Dept. of Microbiology, MSC-UPR.

Our studies investigated the potential for VecB7, a SIVsm DNA-based vaccine that produces virus-like particles (VLP) in vitro, to induce protective responses in rhesus macaques using a DNA prime/protein boost strategy. In addition, enhancement of antiviral immune responses was attempted by co-delivery of antigen with rhesus macaque IL-12 and GM-CSF as adjuvants. A group of 5 animals received 3 immunizations with 2mg VecB7 DNA together with DNA encoding the cytokine adjuvants (half DNA ID + half IM via Biojector), and were boosted with 500mg SIVsmB7 VLP plus 5mg/ml recomb. rhesus IL-12 in alum. A control group received empty vector + DNA encoded adjuvants and were boosted with SIVsmB7 VLP + IL-12. A naïve control group was also included. The animals were challenged intrarectally with  $10^5$  TCID<sub>50</sub> SIVsmE660 2 months after the protein boost. Prior to challenge, CTL against SIV Env and Gag were detected in only 1/5 vaccinees whereas neutralizing antibodies (Nab) were undetectable in all animals. With the exception of one vaccinee, all animals became infected post-challenge. The prime-boost regimen reduced peak viremia and plasma viral set point by >2 logs as compared to the naïve group (p<0.05). In the 4 infected vaccinees, plasma viral loads were below the detection threshold (500 vRNA copies/ml) from 8 wks post challenge to the current 18 wks time point. In contrast, the protein only vaccine control group showed viral loads surprisingly equal or higher than the naïve control group. Secondary Nab responses were noted against the vaccine strain, SIVsmH4, but not against SIVsmE660 in the vaccinees, while no secondary Nab responses were noted in naïve controls. The results indicate that this vaccination regimen induces protective immune responses against the replication of a pathogenic lentivirus and for the prevention of AIDS.



**P-36 Regulation of Excitatory Amino Acid Transporter (EAAT) Activity in Rat Hippocampal Slices by Intracellular  $[Ca^{2+}]$ .** J.G. Ortiz, O.I. Claudio, and N. Berrios, Department of Pharmacology and Toxicology, University of Puerto Rico School of Medicine, San Juan, Puerto Rico 00936-5067

Excitatory amino acid transporters (EAAT 1-5) bind, and subsequently remove extracellular glutamate (Glu) maintaining levels in the low micromolar range. Increased, decreased and unaltered EAAT activity have been reported in different epilepsy models (Meldrum et. al., 1999). Veratridine (Vera) causes epileptiform activity and markedly decreases EAAT activity as indicated by the accumulation of  $[^3H]$ Glutamate in rat hippocampal slices (Claudio et al, 2000). Tetrodotoxin, a blocker of voltage-sensitive  $Na^+$  channels does not fully revert the effect of Vera. However, removal of extracellular  $Ca^{2+}$  potentiated the inhibitory effects of veratridine on EAAT activity. Inhibition of  $Na^+/H^+$  antiporter, the  $Na^+/Ca^{2+}$  exchanger or voltage-sensitive  $Ca^{2+}$  channels (L, P, N, Q, T) did not alter the effects of Vera suggesting that extracellular  $Ca^{2+}$  is not involved in the effects of Vera. However, co-incubation of Vera with the intracellular free  $Ca^{2+}$  chelator BAPTA-AM markedly enhances the inhibitory effect of Vera on glutamate uptake suggesting that intracellular  $Ca^{2+}$  mediated the effects of Vera. (BAPTA-AM alone has little effect). Inhibition of  $IP_3$  -sensitive  $Ca^{2+}$  stores by heparin did not change the effects of Vera, while ryanodine (releases  $Ca^{2+}$  release from SERCA stores) tends to potentiate the effects of Vera on EAAT activity. Thus, intracellular Ca modulate EAAT activity and represent a novel pharmacological approach. (Supported by the NINDS/SNRP Program).

**P-37 Shortening of labor with propranolol virtually eliminates post partum blood loss.** Santiago, R.; Briones, C.; Adamsons, K., Department of Obstetrics and Gynecology, School of Medicine

Post partum blood loss due to uterine atony is the major cause of maternal morbidity and mortality. It is estimated that close to 200,000 women die annually from this disorder worldwide. Homo sapiens seems to be the only species among primates afflicted with this complication of delivery. We are proposing that it is due to the abnormally long labor of our species causing exhaustion of the uterine muscle. In the videotaped rhesus monkey in which labor last usually less than 40 minutes, there is hardly a measurable blood loss post partum. To test the hypothesis

that length of labor affects post partum blood loss of patients, we compared the change of post partum hemoglobin and hematocrit of patient's in whom the mean duration of labor was reduced to less than 4 hours by eliminating the inhibitory effect of endogenously released epinephrine by propranolol (20 to 40 mg po or 2 mg i.v.) The control group, which was matched for age and parity, had a mean duration of labor of more than 8 hours. Patients in the control group had a post partum fall of Hct and Hgb of 2.1 % and 1.0 g/100 ml. In contrast the group with propranolol shortened labor had a post partum rise of Hct and Hgb of 1.1 % and 0.5 g/100 ml respectively. We propose that duration of labor should be reduce in all women, by eliminating the epinephrine interference with the required post contraction shortening of the myometrial cell, not only to reduce her stress, and to give a better condition to the newborn (higher AS and higher pH and PO<sub>2</sub> in cord blood) but mainly to minimize maternal morbidity and mortality associated with parturition.

**P-38 Evolución Histórica de la Profesión de Enfermería en Puerto Rico desde los Precolombinos hasta el siglo XX.** Lydia Pérez, RN, MSN, Catedrática, Universidad de Puerto Rico, Recinto Universitario de Mayagüez  
Departamento de Enfermería

El proyecto de investigación histórica comenzó en 1992 y finalizó en diciembre de 1997. Los objetivos del trabajo fueron: 1) identificar las raíces profesionales de la enfermería en Puerto Rico mediante la investigación histórica, 2) describir la contribución de la enfermera y el enfermero puertorriqueño en el mantenimiento y la salud de nuestro pueblo, 3) contribuir a conservar el patrimonio histórico-cultural de este profesional para beneficio de presente y futuras generaciones. Se elaboró un bosquejo en orden cronológico que sirvió de guía para la búsqueda de datos de nuestras raíces profesionales. La recopilación de datos se origino en documentos escritos: libros de historia de Puerto Rico, revistas, leyes, reglamentos, certificaciones, entre otras. Lectura de clásicos de autores tales como, Fray Iñigo Abad y Lassierra, Agustín Stahl, Aurelio Tío, Quevedo Báez, entre otros. Entrevistas a líderes, visitas los archivo de la Junta Examinadora de Enfermeras y Enfermeros de Puerto Rico, Consejo de Educación Superior, Colegio de Profesionales de la Enfermería de Puerto Rico, Tribunal Examinador de Médicos, museos, hospitales, tribunales, bibliotecas, Instituto de Cultura Puertorriqueña, Archivo de Puerto Rico, entre otros. El proceso fue arduo y exhaustivo pues los datos históricos de nuestra profesión están

diversos y fragmentados. La investigación culminó con la publicación en 1997 de un libro titulado: "**Enfermería en Puerto Rico desde los Precolombinos hasta el siglo XX**". Este libro incluye un análisis histórico-social de la profesión de enfermería destacando las aportaciones de la enfermera y enfermero a nuestro país. El libro se organizó en ocho capítulos. En el primer capítulo se discuten las prácticas de salud de la cultura taína. En el segundo capítulo describo las contribuciones de la cultura española en el cuidado del enfermo, el tercer capítulo resume los eventos más significativos en enfermería con la llegada de los americanos a la Isla, en el cuarto hago una descripción cronológica de todos los programas educativos en enfermería en la Isla desde 1903 hasta el presente. En el quinto capítulo se discuten las especialidades en que la enfermería se destacan en el capítulo seis, el capítulo siete contempla la estructura organizativa de nuestra profesión y culminó con el capítulo ocho haciendo un recuento de las contribuciones de enfermería en las epidemias del siglo XX. En la portada describo una relación pictórica de nuestra evolución como profesión desde los taínos hasta el siglo XX. Es importante destacar que el libro se ha distribuido en Puerto Rico, Santo Domingo, Cuba, Panamá, Colombia, Brasil, México, Chicago (Biblioteca Virginia Henderson), Instituto de Cultura Puertorriqueño, Biblioteca del Capitolio y Colegio de Profesionales de la Enfermería de Puerto Rico, entre otros. El texto provee para el enriquecimiento intelectual y cultural de toda la población estudiantil de enfermería para profesionales de la salud y ciudadanos en general. El libro ha sido un hito en la isla y un arquetipo para los países de Hispanoamérica. Además es un legado histórico al país y generaciones futuras de enfermeras y enfermeros.

**P-39 Hazards of Alpha Adrenergic Blocking Agents in the Treatment of Preeclampsia.** Salicrup, E.; Adamsons, K., Department of Obstetrics and Gynecology, School of Medicine.

Preeclampsia differs from essential hypertension because increase in inotropic effect of heart is not compensated fully by arteriolar constriction, thus causing increase in hydrostatic pressure in capillaries. According to this theory, vasodilators are contraindicated in the treatment of preeclampsia. Alpha adrenergic blocking agents (AABA) should be particularly hazardous because they prevent the constriction of the branches of internal carotid artery (ICA) in the presence of elevated B.P. We are presenting two cases in which intracranial hemorrhages occurred following the use of labetalol, an agent with

alpha and beta receptor blocking properties. The first patient was an 18 y g1 transferred from community hospital because of severe preeclampsia at 32 g.w. with BP of 220/130. She was given magnesium sulfate and 20 mg of labetalol i.v. This lowered systolic BP from 220 to 160, when she was transferred to the University Hospital. On admission patient was stable, but complained of headache and visual disturbances. Because of BP of 160/110, she was given 20 mg of labetalol i.v. Within 15 min patient became disoriented, and later comatose. She died of massive intracranial hemorrhage while had blood pressure never exceeded 160/115. The second patient, a 27 y p3 was transferred from a community hospital where she had been treated for post partum eclampsia with labetalol 20 mg i.v., Ativan 2 mg i.v. and Dilantin. On admission she was comatous. CT revealed brain swelling and four foci of cortical and basal ganglia hemorrhages. She gradually recovered and was discharged in 8 days. These two cases support our view that AABA are contraindicated in treatment of preeclampsia because they eliminate reduction of the diameter of the branches of ICA to keep the force constant in the presence of elevated BP. Experimental studies are planned to measure the internal diameters of carotid artery and its branches before and after alpha adrenergic blockade.

**P-40 Sustained Correction of Maternal Hypovolemia Restores Synthesis of Albumin of a Preeclamptic Patient.** Briones, C.; Adamsons, K., Department of Obstetrics and Gynecology, School of Medicine

Maternal hypoalbuminemia is found in virtually every patient with preeclampsia, except in preeclampsia due to sudden avulsion of spiral arteries. Since the standard management of preeclampsia is to terminate the pregnancy, there is no information whether hypoalbuminemia is secondary to a decrease in the perfusion of liver or to some intrinsic problem of the liver to synthesize albumin. Our department represents the view that preeclampsia is caused by yet to be identified substances, most likely polypeptides, released by the hypoxic trophoblast. Therefore our intervention is focused on the correction of intervillous P<sub>O2</sub> to norm, which in many patients can be achieved, at least temporary, by correction of maternal hypovolemia and the high viscosity of blood secondary to hemoconcentration.

Our patient was a 30-year-old primigravida at 27 weeks of gestation. She had essential hypertension, insulin dependent diabetes, and long standing nephrosis. She



was admitted because of superimposed preeclampsia with BP 180/110 and proteinuria 6 g per day. The fetus was in the 26<sup>th</sup> growth percentile. After correction of hypoalbuminemia of 2.9 g/100 ml by daily administration of 12.5 to 25 g of albumin for one week, symptoms of preeclampsia cleared with BP returning to 130/90. Her plasma albumin concentration gradually increased, reaching 4.2 g/100 ml, and remained at this level until delivery by C.S. at 31.5 weeks. The preterm fetus, which had received intramniotic T4 for 3 weeks for acceleration of maturity did not require ventilatory assistance. This case illustrates the ability of the liver of the patient with preeclampsia to resume normal synthesis of albumin as long as hypovolemia is corrected.

**P-41 Iatrogenic Hyperglycemia Restores Growth of a Hyposomic Fetus.** Salgueiro, J, De La Vega, A, Adamsons, K, Department of Ob-Gyn, School of Medicine.

A 30 years old, insulin dependent, hypertensive, hypothyroid, diabetic G1 with long standing nephrosis was admitted at 27 weeks of gestation because of signs of superimposed preeclampsia manifested by non-dependent edema, further increase in BP (to 180/110), and proteinuria of 6 g/day. Her MFM obstetrician had kept her on tight blood glucose control, and she had received methyldopa 750 mg tid during the antepartum course. Sonography revealed the fetus in the 26<sup>th</sup> growth percentile for gestational age. After correction of hypoalbuminemia of 2.9 g/100ml, and hypovolemia by daily administration of 25g to 12.5g of albumin for 1 week, her edema cleared and her BP returned to levels observed earlier in antepartum course (130/90). Ultimately her plasma albumin reaches 4.2 g/100ml. Because of the small placental size and therefore a projected low intervillous space perfusion rate, fetal hypoglycemia and thus hypoinsulinemia was thought to be responsible for the low growth rate of the fetus. To correct it, maternal glucose was adjusted to be between 150 to 200 mg/dl by changing the doses of insulin, but without producing a rise in ketoses, which remained undetectable. In addition, fetal maturation was accelerated with 3 weekly administrations of 500 ug T4 intraamniotically. Four weeks after her admission and 3 weeks after initiation of administration of albumin, the fetus was in the 45 growth percentile. Patient then developed rather suddenly uterine contractions and effacement of cervix, which was thought to be due to avulsion of some spiral arteries ("partial abruptio of placenta"). Because the fetus was in breech

presentation, she was delivered by cesarean section. The 1330 g fetus had an Apgar score 7-8 and did not need any ventilatory assistance. We propose that hyperglycemia of the mother during the last 3.5 weeks of gestation corrected the hypoinsulinemia of the fetus and thus restored fetal growth toward norm.

**P-42 The Spherical Alveolus: Fact or Fiction.** George, R; Adamsons, K., Dept. of Obstetrics and Gynecology, School of Medicine

Using spherical model of the alveolus to describe lung mechanism is as erroneous as accepting the concept the Earth as the center of the Universe. As a responsible scientific community, we have to take time to examine well-accepted concepts that are incompatible with reality, especially if they are influencing the direction of research and our clinical practice. Assuming the existence of spherical alveoli, time and efforts have been expended formulating hypotheses that explain the presence of surface tension reducing substances trying to resolve ventilatory problems of pre-term infants. This model forced us to assume that breathing occurs by stretching of the walls of the alveolus, increasing the alveolar surface. This is not compatible with the histology of the lung, nor with the shape of the alveolus required to account for the low density of 0.16 of the inflated lung. To maintain a spherical shape, the expanding alveoli would also need to expand the interalveolar space, which would require increasing and decreasing the lung mass during ventilation. The alveolus changes its size not by stretching but by changing the angles of intercept between the walls, and the compliance of the parenchymal components is the most important variable in determining if the lung can be expanded. The clinical experience shows that artificial surfactants improve the gas exchange in preterm newborn. The accepted explanation which is based on the hypothesis that the monomolecular layer of water covering the alveolus needs surfactants to facilitates the stretch of the cell wall, and prevents its shrinkage during expiration, is incompatible with reality. Surfactants might improve the retention of gas in the alveoli by bubble formation in the alveolar ducts or bronchioles, preventing the less elastic peri-alveolar tissue from expressing most of the gas during expiration. These should force us to dismiss the concept of the spherical alveolus and the importance given to surfactants in ventilation, as it happened with the concept of the Geocentric Universe back in the 17<sup>th</sup> century.

**P-43 Causes of Recurring Polyhydramnios After Fetal Death in Fetal-Fetal Transfusion Syndrome.** Aviles, A.; Burgos, R.; Salicrup, E.; Adamsons, K., Dept. of Obstetrics and Gynecology, School of Medicine

Available literature does not deal with the causes of polyhydramnios except in cases of esophageal atresia. We propose that in the majority of cases polyhydramnios is due to lower than normal concentration of the glomerular filtrate by the renal tubule, producing polyuria. The cause could be inadequate antidiuretic hormone (ADH) secretion, or paucity of ADH receptors in the renal tubule. A 38 y, g2, p0 was admitted at 27th gestational week, because of twin to twin transfusion syndrome with marked polyhydramnios. Fundal height was 53 cm. Donor twin was dead. Amniocentesis yielded 4,450 ml amniotic fluid. After correction of hypovolemia and hypoalbuminemia with albumin, her symptoms of preeclampsia cleared. The amniotic fluid volume, however, increased requiring aspiration of 600 ml one week later. Thereafter the volume of amniotic fluid remained normal. Patient was seen weekly after her discharge at 29 wks. Hypervolemia and overhydration is known to lead to suppression of ADH secretion and, if prolonged, causes disappearance of neurosecretory granules in neurons of supraoptic nuclei. (J. Endocrin 15, 332, 1957) We propose that the continuation of polyhydramnios for one week after death of the donor fetus represents low ADH stores of the neurons of the supraoptic nuclei secondary to prolonged hypervolemia of the recipient twin. Administration of antidiuretic hormonal (long acting preparations) should be considered in the management of certain forms of polyhydramnios.

**P-44 Death of a Macrosomic Fetus at 36 Weeks Reinforces the Value of Accelerating Fetal Maturation in Gestational Diabetics.** Burgos, R.; Adamsons, K., Dept. of Obstetrics and Gynecology

Standard management of gestational diabetics in the U.S. calls for avoidance of maternal hyperglycemia, and delivery of the fetus near term. This, however, has not reduced significantly the relative frequency of fetal macrosomia with life long sequelae such as hypertension and obesity. We suggest that it is due to a prolonged release of insulin from the immature Langerhan's islands in response to episodic hyperglycemia. Our previous work with insulin containing micropump implantation in the fetal rhesus monkey has documented nearly a doubling of myocardial mass in less than 3 wks by an

increase in myocyte number, and not by their hypertrophy. We also have demonstrated extensive proliferation of adipocytes in the hyperinsulinemic fetuses. It is for these reasons that our departmental policy calls for acceleration of fetal maturation with intraamniotic thyroxin, or by causing endogenous release of fetal T3 and T4 by oxytocin induced uterine contractions, to shorten the exposure of the fetus to hyperinsulinemia. The success of this program, initiating acceleration of maturation between 30 to 31 weeks, and by delivering the fetus before the end of the 35<sup>th</sup> week, has been reported previously. We present a case managed traditionally. The patient was a 33 yrs, g3, p2, gestational diabetic at 33 weeks of gestation. Her hyperglycemia was allegedly controlled with diet only. She was seen at regular intervals at our High Risk Antepartum Unit. At 36 weeks no fetal heart rate was present. Because of the large fetus, and previous CS, the delivery was by hysterotomy. A 4,756 g dead fetus was delivered from a partially ruptured uterus. There were no cord complications, and the amniotic fluid was clear of meconium, as expected when fetal death is due to normocarbic hypoxia. This case illustrates well the limitations of the standard management of patients with gestational diabetes mellitus.

**P-45 Normotensive Preeclampsia: an Unrecognized Entity.** Bravo, M.; De La Vega, A.; Adamsons, K., Dept. of Obstetrics and Gynecology, School of Medicine

We have defined preeclampsia as a unique state of the cardiovascular system in which the increased ionotropism of the heart is not fully compensated by peripheral vasoconstriction, thus causing high hydrostatic pressure in the capillaries. Therefore, in this disorder systolic BP does not have to be always elevated as long as vascular conductance is high. The abnormally high filtration pressure in the capillaries will cause proteinuria and extrusion of intravascular fluid, causing hypovolemia, hemoconcentration, edema of tissues and organs, and reduced perfusion of "non-essential" vascular beds such as that of liver, uterus and kidney. The traditional definition of preeclampsia mandates the presence of elevated BP, which explains absence of the entity "normotensive preeclampsia" from clinical literature. We propose that prior to the hypertensive phase, preeclampsia might be expressed in hypovolemia, hypoalbuminemia, edema and ascites. A patient admitted recently to the University hospital illustrates such a state. A 22 y, g1 was admitted at 31 g.w. because of proteinuria, generalized edema and ascites. We had followed her at the High Risk antepartum

clinic because of elevated alpha fetoprotein suspected of placental origin. Her BP was 120/70, Hgb 16 g/dl, and Hct 47%. Because of hypoalbuminemia of 1.6 g/dl she received 100 g of albumin over 36 hrs, which markedly reduced the edema and ascites. Hgb fell to 13 g/dl. Anticipating preterm delivery, we accelerated maturation of the fetus by i.m. and intraamniotic thyroxin (500 Fg). With correction of hypovolemia, BP started to rise reaching 160/110 for which she received propranolol. Two days later, because of further increase in diastolic BP and decrease in urinary output, she was delivered by C/S of a 1350 g fetus. Ascites of 1000 ml was present. The newborn did not require any ventilatory assistance. The mother became normotension over the next 4 days. We conclude that the disorder referred to as preeclampsia or PIH is likely to have phase in which the main circulatory abnormality is only a too high arteriolar conductance.

**P-46 Cause of Preeclampsia in Patients with Twin to Twin Transfusion Syndrome.** Burgos, R.; Salicrup, E.; Aviles, A.; Adamsons, K., Dept. of Obstetrics and Gynecology, School of Medicine

We have provided evidence by analyzing blood obtained by cordocentesis that preeclampsia is caused by some yet to be identified substances released by the hypoxic trophoblast. Among the various events that can cause lowering of PO<sub>2</sub> of the intervillous space (IVS), edema of the villi, secondary to a high resistance to blood returning by the umbilical vein due to obstructive processes of fetal liver, is expected to occur in the presence of such diverse disorders as hyperinsulinemia of the fetus (GDM), fetal syphilis, glycogen storage disease, and hemolytic anemia. Excessive hepatic erythropoiesis due to continuous blood loss of the donor fetus in a twin to twin transfusion syndrome is also expected to lead to compression to IVS due edema of villi. This process can be interrupted by ligating the connecting artery (ies), or by death of the donor fetus, which should lead to a cure of preeclampsia. A 38 y/o, g2, p0 at 27 gestational week with twin to twin transfusion syndrome was transferred to UH because of preeclampsia with BP 160/ 110, proteinuria and marked facial and upper extremity edema. The donor twin was dead on admission. After correction of hypovolemia and hypoalbuminemia with albumin, and decompression of the amniotic cavity of 4,450 ml, the signs of preeclampsia gradually cleared, and she was discharged home at the 29<sup>th</sup> week to be followed on outpatient basis. This case illustrates well the curability of preeclampsia of certain etiologies without the termination of pregnancy.

**P-47 The Tuskegee Legacy: Its Impact in the Puerto Rican Population.** Claudio, C. School of Dentistry, MSC, UPR

Throughout the years minorities have been underrepresented as participants in medical research studies. This study aimed to determine if socio-demographic and psychosocial factors, specific study circumstances, knowledge & perceptions of medical history events as well, influence the willingness of Greater San Juan Area Puerto Ricans (GSJAPR) to participate as subjects in medical research. The sample of the study consisted of 123 subjects from the GSJA accessed at convenience. The instrument for this study was the Tuskegee Project Legacy Questionnaire (TPLQ) Spanish version, administered through a person-to-person interview. Several statistical analyses were applied to results. Results show that the likelihood of participation in medical research studies of subjects is influenced by different factors. On the one hand, their educational and income levels. On the other hand, it might also depend upon who conducts the study: their doctor, a medical school or a non-profit foundation, government, drug or insurance company, or tobacco company. It was also found that having to give blood, to do exercise, have a restricted diet, undergo major or minor surgery, or to take medicine by mouth influence the participation of people from different educational and income levels, gender and age. Fears such as getting AIDS, being a "guinea pig", or not having healthy children, among others, also represent obstacles for participation in medical research studies. The majority of subjects feel that AIDS, is the result of government plans gone bad. They are not quite sure if Ebola or Tuberculosis are also the results of government studies gone bad. However, they indicated that it is "somewhat unlikely to very unlikely" that these diseases are the results of a government plan to intentionally kill certain group of people.

**P-48 Development of Strategic Planning Abilities for the Implementation of a Pharmaceutical Care Practice.** Homero A. Monsanto, Ph.D., Myriam González, M.P.H., Department of Pharmacy Practice, School of Pharmacy, University of Puerto Rico.

As the profession of pharmacy embraces pharmaceutical care as its philosophy of practice, there is a need for pharmacists to develop the knowledge, skills and attitudes to implement such practice. A fundamental step in this process is the development of a strategic plan. The

objective of this presentation is to describe an approach to develop strategic planning abilities for the implementation of a pharmaceutical care practice in a real-life community pharmacy. An elective course was designed and offered to second-year pharmacy students to foster the application of concepts related to the implementation of a pharmaceutical care practice. The owners of a community pharmacy who had expressed interest in re-focusing their practice to allow for the provision of pharmaceutical care were contacted and asked to collaborate in the course by allowing their pharmacy to be used as a case study. Students visited the pharmacy and, working as a team, collected the data necessary to develop a strategic plan in collaboration with the owners. A mission statement was developed, an environmental analysis was conducted and operational and evaluation plans were designed. Formative evaluations of the plan were conducted periodically and communicated verbally and in writing throughout the course by the facilitators. The main outcome of the course was the development of a strategic plan and its presentation to the owners. Students agreed that the teaching strategy was useful for their learning. They found the course very relevant to their professional development. However, they indicated that the project was very challenging and that required a substantial amount of effort in relation to the time allotted to develop the plan. This educational strategy allows students to interact with practitioners and share experiences and ideas regarding the development of a strategic plan for the implementation of a pharmaceutical care practice.

**P-49 Puerto Rican Pharmacists Level of Knowledge, Interest and General Opinion Regarding the Pharm.D. Degree.** Y D López, RPh, D J Hoyos-Colón, RPh, L LAI, PhD, College of Pharmacy, NOVA Southeastern University

The main purpose of the study is to evaluate Puerto Rico pharmacists' perceptions on the level of understandings, interests and general opinions of the Pharm.D. degree. Questionnaires were distributed at the beginning of each continuing education session that was presented at the PR Annual Pharmacist Convention held August 2000. The questions sought general demographic information, pharmacist (RPh) level of knowledge about the Pharm.D. degree, interest and obstacles in obtaining the degree, preferred study program to complete the degree, practice setting of choice if the degree were completed and when the Pharm.D. degree would be required to practice in PR. A total of 425 questionnaires were completed with a

response rate of 57%. Of the RPh surveyed 62.8% stated they were somewhat familiarized with the Pharm.D. degree and 29.7% stated they were very familiarized with the degree. The mayor factors that motivate RPh to pursue the degree were to improve clinical skills and not be left behind in the profession. Lack of spare time and family commitments were the two mayor factors that deter RPh in pursuing the degree. A Non-Traditional Pharm.D. program that allows RPh to work full time and study at a part time basis was the preferred alternative to complete the degree. Most RPh selected hospital pharmacy as the practice setting of choice if the degree were completed. A 33% of the RPH stated that the Pharm.D. would not be necessary to practice in PR and 24.9% stated that the degree would be needed at this moment. Of the surveyed RPh 59.3% would be interested in completing the degree. The results of this survey reveal that more than half of RPh surveyed were interested in perusing the Pharm.D. degree through a Non-Traditional program motivated by their desire to improve their clinical skills and not be left behind in the profession. A fact of interest found was, that only 29.7% of the respondents had a full understanding of the complete concept of the Pharm.D.

**P-50 Sudden Resolution of Hydramnios in the Recipient Twin Heralds a Poor Prognosis for the Donor in the Twin Transfusion Syndrome.** De La Vega, A., Aviles, A., Cintron, E., Department of Obstetrics and Gynecology, University of PR, School of Medicine

The twin transfusion syndrome is produced by an imbalance in vascular connections in a monochorionic twin pregnancy. The net passage of blood from one fetus to the other occurs when a placental cotyledon is supplied by a fetal artery and drained by the vein of the second fetus. At the same time, this situation is not compensated by another vascular connection. This anomaly creates a persistent vascular imbalance in which the donor twin tends to be chronically hypovolemic, and, thus, produces less urine developing oligohydramnios while at the same time, the recipient twin is hypervolemic and produces excess urine (developing hydramnios). The volume of amniotic fluid has often been used as an indicator of severity with normalization of the amniotic fluid volume usually seen as a favorable sign. We present a case of twin transfusion syndrome diagnosed at 16 weeks of pregnancy. Excess of amniotic fluid in the recipient twin was documented since this time and persisted until the 27<sup>th</sup> week of pregnancy. At this GA, the amniotic fluid index dropped dramatically (from 24 to 10 in 1 week).

Doppler waveform analysis of the recipient twin did not detect development of vascular redistribution or any other sign of placental insufficiency. These findings were followed in the next few days by death of the donor twin. We conclude that the sudden resolution of hydramnios in the recipient twin is suggestive of severe compromise in the donor and heralds the development of vascular collapse with, potentially, death of the donor twin. Contrary to the presumption that development of normal amniotic fluid in the recipient is a good sign that the condition is stabilizing, it should be considered a potential sign of compromise in the donor twin.

**P-51**      **Acceptance Rates of Amniocentesis are Influenced by Method of Risk Assessment.**  
Leavit, G.; de la Vega, A.; Salgueiro, J.,  
Department of Obstetrics and Gynecology,  
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Assessment of risk for chromosomal anomalies is an integral part of modern obstetric management. Evaluation of multiple risk factors are used to calculate the relative risk of having a child with aneuploidy. Irrespective of the method used, a risk estimated to be greater than 1/200 to 1/250 will be considered indication for genetic amniocentesis. However, patients may reject a genetic amniocentesis, based, not necessarily on the calculated risk but on the method used. This creates a bias in favor of some methods and may affect sensitivity of screening. Records of all patients referred to our high-risk prenatal clinic for estimation of risk of aneuploidy were evaluated from January 1999 to December 2000. Patients found to have a risk of chromosomal anomalies greater than 1/250 were divided into one of 4 groups depending on the risk factor detected: advanced maternal age, abnormal serum screening, abnormality or marker identified on ultrasound, or a previous child with congenital anomalies. Patients with more than one risk factor were excluded for analysis. A total of 542 patients were evaluated. Of these, 349 patients (64.4%), accepted amniocentesis. Acceptance rate of amniocentesis varied depending on risk identified, ranging between 54% and 79%. Abnormal serum screening had the lowest acceptance rate, and a previous child with a congenital anomaly gave the highest acceptance rate. These differences were not expressing the risk, but the method of risk assessment. The willingness to accept an amniocentesis when risk was calculated on sonographic findings or history, suggests that our patients view these methods as more reliable. Physicians may be more emphatic in recommending genetic amniocentesis depending on the method used to

estimate risk. This may reduce significantly the sensitivity and specificity of methods such as biochemical screening, and should be taken into account when counseling patients.

**P-52**      **Incidence of Echogenic Intra-cardiac Foci in a Hispanic Population.** De La Vega, A.; Rampolla, C.; Rodríguez, J., Department of Obstetrics and Gynecology, University of PR, School of Medicine

Intra-cardiac echogenic foci are small areas of increased echogenicity seen inside the fetal ventricles, most commonly in the left. They are believed to originate from the papillary muscles or the cordae tendineae. When isolated, they are considered a normal finding. In the general population reported incidences vary from .3-2% among Caucasians to as high as 5% among Asians. This finding has also been reported to be a weak marker for trisomy 21 and other chromosomal anomalies with an associated relative risk of 1.6. In order for a finding such as this one to be applicable to our population and have potential prognostic value in risk assessment for chromosomal anomalies, it would need to have an incidence that is as low as that in the report groups. A higher incidence (such as in the case of Asian populations) would negate its value as a "marker" for chromosomal anomalies. We examined prospectively 226 second trimester sonograms done for fetal anomaly screening in a group of Hispanic patients. The incidence of isolated echogenic intra-cardiac foci was calculated. Fetuses with congenital anomalies detected by sonography or the presence of any marker for trisomy were excluded. 3 cases of isolated echogenic intra-cardiac foci were identified. All of these foci were located in the left ventricle. The calculated incidence of this condition in our population was 1.3%. Our data shows similar incidence as that among Caucasian groups. This makes this sonographic marker potentially applicable to our Hispanic population. As we continue to add more cases we will be able to corroborate these results.

**P-53**      **Effect of Maternal Age on Pregnancy Planning in Puerto Rico.** De La Vega, A; Cruzado, P., Department of Obstetrics and Gynecology, University of PR, School of Medicine

Family planning is basic to most prenatal care programs. Use of Folic acid, limiting of family size, pre-conception counseling, risk assessment and prevention of high-risk behavior are best achieved when pregnancies are planned.

It is generally believed that younger patients tend to have a higher incidence of unplanned pregnancies while the older age groups commonly plan their pregnancies. This preconceived idea is unproven. We evaluated 481 consecutive pregnancies in both a private and a general service clinic and inquired about the planning of the current pregnancy. Patients were divided among three age groups: less than 20, 20-29 and > 29 years old. Incidences of planned pregnancies were compared among each group. Among a total of 470 pregnancies, only 170 (36.1%) were planned. Comparison of age groups revealed an incidence of planned pregnancies of 18/60 (30.0%) in the less than 20 year old group, 105/270 (37.0%) in the group 20 to 29 year old and 47/140 (33.6%) in the >29 year old group. The differences in the incidence of planned pregnancies among the different age groups were not significant. The incidence of unplanned pregnancies in our general population is surprisingly high. Considering that only pregnancies that were not terminated electively were registered, the incidence of unplanned pregnancies in our population is much higher since the overwhelming majority of pregnancies that undergo an elective abortion are unplanned. Taking this group of patients into consideration, the true rate of planned pregnancies in our population may be less than 15%. Surprisingly, there were only small differences in the incidence of planned versus unplanned pregnancies among the different age groups. The lack of influence of age as a factor in pregnancy planning is unexpected and challenges the contention that the irresponsible behavior associated to immaturity is a significant factor in the rate of unplanned pregnancies in our population.

**P-54** **A Nationwide Program for Pre-conceptual Folic Acid Use to Prevent the Development of Open Neural Tube Defects. Who is Really Using Folic Acid?.** De La Vega, A; Salicrup, E.; Dept. of Obstetrics and Gynecology, University of Puerto Rico School of Medicine

A nationwide program for pre-conceptual use of Folic acid (FA) for the prevention of open neural tube defects has been in effect in Puerto Rico for the last 3 years. Irrespective of the merits of such a program, after millions of dollars spent in publicity,

its effectiveness in motivating women to use it should be reviewed. A questionnaire was administered to patients referred to one of two prenatal services from September 2000 until January 2001. Use of FA prior to conception, planning of pregnancy, prior knowledge about the effects of FA, and sources of information to patients were assessed. 479 questionnaires were reviewed. The average age was 27.0 (range 14-41), and the average gravity was 2.3. Pre-conceptual use of FA was 151/479 (31.5%). There were 311/479 pregnancies (64.9%) unplanned. 420 patients (87.7%) reported knowledge of the importance of pre-conceptual use of FA. 54.3% reported that they learned of this information through the media, friends, family, school or work while the rest (45.7%) obtained this information through physicians or nurses. Only 225/420 (53.6%) of patients who had prior knowledge, used it. When these pregnancies were divided among planned and unplanned, 92 of 168 (54.8%) patients who planned their pregnancies reported pre-conceptual use of FA, while 57/252 (22.6%) of those who had knowledge, but did not plan their pregnancies, used it. After spending millions of dollars in publicity to encourage the use of pre-conceptual FA, a dismal 31.5% of patients use it. One important factor is the low incidence of planned pregnancies in our population. However, this can't be the only factor involved since only 54.8% of patients who had prior knowledge of FA effects, used it. We believe this campaign should re-consider its educational strategy and consider the reduction of unplanned pregnancies as part of its goals.

**P-55** **Monoamines Modulate Glutamate Uptake In Rat Prefrontal Cortex.** Berrios, N., Gonzalez, S., Claudio, O. I. And Ortiz, J.G. Department of Pharmacology and Toxicology, University of Puerto Rico School of Medicine, PO Box 365067, San Juan, Puerto Rico 00936-5067

In the prefrontal cortex (PFC), glutamate (Glu) is strongly implicated in some long-term effects of cocaine such as sensitization, a persistent behavior similar to panic attacks, anxiety and paranoid psychosis. Cocaine inhibits the reuptake of dopamine (DA), serotonin (5-HT) and norepinephrine (NE) with similar potency. Inhibition of serotonin uptake by sertraline

(Zoloft®) results in a marked decrease EAAT (Excitatory Amino Acid Transporter) activity in PFC slices. In contrast, inhibition of DA and NE uptake by bupropion (Wellbutrin/Zyban®) has no effect. In rat hippocampal slices, intracellular  $Ca^{+2}$  appears to play a major role in the regulation of EAAT activity. In PFC slices, bupropion causes inhibition of EAAT activity in the absence of extracellular

$Ca^{+2}$  suggesting that similar regulatory mechanism(s) may be present in PFC. The combination of sertraline and bupropion results in a marked inhibition of EAAT activity in PFC slices. Significant interference with EAAT activity by inhibition of monoamine uptake could result in enhanced Glu transmission in PFC. (Supported by the NINDS/SNRP 5U54NS39408-02).

