

## CLINICAL STUDIES

# Failure of Intensive Fetal Monitoring and Ultrasound in Reducing the Stillbirth Rate

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Although highly popularized among obstetricians, there are conflicting results regarding the efficacy of high-resolution ultrasound and other fetal well-being tests on improving neonatal outcome and morbidity. To assess the impact of unrestricted fetal well-being tests and sonographic evaluations on the stillbirth rate, we evaluated a total of 1,810 pregnancies 20 weeks of gestation or more from a single private clinic serving a mixed population of high and low-risk patients. All patients were performed high-resolution sonography during each trimester of pregnancy. In addition, on each prenatal visit, fetal heart rate, position and amniotic fluid index were documented by a limited sonographic scan. Further sonographic studies were done whenever deemed necessary depending on the clinical situation. Biophysical profiles were performed in the third trimester at any time a risk factor was identified, and repeated as frequently

as estimated necessary. All cases of fetal death in utero were documented and the associated maternal risk factors assessed. A total of 14 stillbirths occurred among the 1,810 patients. The stillbirth rate for this population was determined to be 7.7/1000 births (U.S. national average of 6.7-7.8/1000 births). The most common associated maternal complications were Diabetes (4 cases) and Antiphospholipid syndrome (3 cases). All except for one fetus lost at 37 weeks had at least one identifiable maternal risk factor. These results prove that intensive fetal surveillance, even when unrestricted by economic concerns, has limited effectiveness in avoiding fetal demise. This is most probably due to acute placental and cord accidents that cannot be detected promptly enough or that are simply unavoidable. *Keywords: Intrauterine fetal demise, IUFD, Stillbirth, Neonatal morbidity, Ultrasound, Sonography, Fetal well-being tests.*

High-resolution diagnostic sonography and fetal well-being tests such as the biophysical profile, the non-stress test, and amniotic fluid determinations, represent the gold standards for evaluation and management of high-risk pregnancies. Although highly popularized among obstetricians, there are conflicting reports about the impact of these tests on neonatal outcome and morbidity (1-6). Further analysis of the capacity of these tests to alter the course of pregnancy is needed. Of particular importance would be to assess their impact on the stillbirth rate since the reduction of this complication of pregnancy is a clearly definable goal in obstetrics. Occurrence of fetal death in utero is particularly distressing to both parents and obstetricians and is subject to intense medico-legal scrutiny.

In most private-care populations, economic costs can limit the availability of surveillance tests and represent a cause of concern for both the patient and obstetrician. The lack of evidence regarding the impact of these tests on perinatal morbidity, limit the coverage some medical health care provider organizations are willing to undertake.

The purpose of this study was to assess the impact of fetal well being tests and sonographic evaluations unrestricted by economic constraints, on the stillbirth rate in a private care population.

## Materials and Methods

From January 1993 through January 1997 a total of 1,810 pregnancies 20 weeks of gestation or more were managed at a single private care clinic treating a mixed population of both high and low-risk patients. All patients were performed high-resolution sonography during each trimester of pregnancy by one of two well-trained, obstetricians-sonographers. Repeated studies were done as frequently as deemed necessary based on the clinical condition. In addition, on each prenatal visit, fetal heart rate, position and amniotic fluid index were documented

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by a limited sonographic scan. Biophysical profiles were performed during the third trimester at any time a risk factor was identified, and repeated as frequently as estimated necessary. Neither the patients nor medical insurer covered the costs of these tests so that their availability would not be restricted by economic concerns.

All cases of fetal death in utero were documented and the associated maternal risk factors assessed. The stillbirth rate was calculated for this population and compared to the U.S. national averages for the same time period.

## Results

A total of 14 stillbirths occurred among 1,810 patients during a 4-year period from January 1993 to January 1997. The stillbirth rate for this population was determined to be 7.7/1000 births. This value was not significantly different from the national average of 6.7-7.8/1000 births occurring between 1985 and 1998 (7). The average gestational age at which death in utero occurred was 27.7 weeks (range 20 – 37 weeks).

Table I summarizes all cases. The most common associated maternal complications were Diabetes (4 cases) and Antiphospholipid syndrome (3 cases). All except for one fetus lost at 37 weeks had at least one identifiable maternal risk factor. In this case sonographic evaluations in each trimester and weekly amniotic fluid evaluations had all been normal. Since no maternal complications had been detected, biophysical profiles were not done in this case. In the remaining 8 cases that reached beyond 26 weeks of gestation, biophysical profiles were done on a weekly basis or more.

**Table I.** Associated risk factors in cases for death in utero among a mixed maternal population followed by intensive fetal monitoring.

Time of fetal death in utero (weeks)	Identified risk factors
20	Antiphospholipid syndrome
21	Quadruplet pregnancy
22	Type II Diabetes mellitus
27	Chronic hypertensive vascular disease
28	Antiphospholipid syndrome
29	Antiphospholipid syndrome
29	Systemic lupus erythematosus
30	Triplet pregnancy
31	Quadruplet pregnancy
32	Trisomy 21, Duodenal atresia, Hydramnios
33	Type II Diabetes mellitus
36	Type II Diabetes mellitus
37	Type II Diabetes mellitus

## Discussion

The small number of patients limits interpretation of this data. However, it is relevant since it represents the total experience of a private clinic with unrestricted use of fetal evaluation tests. The lack of impact these tests had on the stillbirth rate even under ideal circumstances, unhindered by economic constraints, is worth further analysis. Several large-scale studies have shown conflicting results when addressing the influence of sonography on improving neonatal outcome (8-11). However, these studies are usually limited by reduced patient access to experienced personnel or limited availability of tests. This may account as the main reason for these observations. In our study, no limits were placed on the number of fetal well-being tests or sonographic evaluations performed. All patients with identifiable maternal complications of pregnancy received at least weekly biophysical profiles starting at 26 weeks. Even uncomplicated patients were examined sonographically on each prenatal visit for evaluation of fetal position, heart rate and amniotic fluid. After this intensive surveillance, an impact on the stillbirth rate would have been expected but was not observed.

Many fetal deaths in utero are secondary to acute placental or cord accidents. These conditions are more common among patients with vascular or systemic illness. However, even with knowledge of increased risks and use of intensive surveillance, these events appear to be unavoidable in many instances. There are clear indications for fetal well-being tests depending on maternal conditions. Still, there are always doubts that more intensive or frequent monitoring could produce better results. Many clinicians assume that more tests mean better care or better outcome and pressure medical care providers into paying for them. Physicians sometimes blame health care provider organizations for any potential harm that could come from them limiting fetal well-being tests. This study does not support these assumptions.

## Resumen

A pesar de la popularidad de las pruebas de bienestar fetal y la sonografía, se han reportado resultados conflictivos en cuanto a su impacto en la mortalidad y morbilidad neonatal. Para revisar el efecto de dichas pruebas en la tasa de natimortos, evaluamos un total de 1,810 embarazos de más de 20 semanas de gestación atendidos en una clínica privada sirviendo a una población mixta de alto y bajo riesgo. Las pruebas y sonogramas fueron provistos sin restricciones de índole económico; a

todas las pacientes se les hizo un sonograma de alta resolución en cada trimestre. En cada visita prenatal se documentó el índice de líquido amniótico, posición y ritmo cardíaco fetal. Se hicieron perfiles biofísicos cada vez que se detectaba un factor de riesgo, y se repitieron según se entendió apropiado en base a la condición clínica. Se documentaron todas las muertes en utero, y factores de riesgo asociados. Ocurrieron 14 muertes en utero entre los 1,810 embarazos. La tasa de natimueertos fue de 7.7/1000 nacimientos (promedio nacional americano: 6.7-7.8/1000 nacimientos). Los factores de riesgo más comunes fueron diabetes mellitus (4 casos) y síndrome de antifosfolípidos (3 casos). Todos, excepto un feto que murió a las 37 semanas, tenían por lo menos un factor de riesgo identificable. Estos resultados indican que la vigilancia fetal intensiva por medio de pruebas de bienestar fetal y sonografía no es capaz de prevenir o identificar todas las situaciones que pueden producir muerte intrauterina. Esto puede ser debido a accidentes placentarios o del cordón umbilical que son impredecibles e inevitables.

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