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3B. Multiple Pregnancy



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Multiple Pregnancy: An International Perspective

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Abstract. This article discusses the following areas of interest related to the obstetric care of multiple pregnancy: 1) methods of diagnosis and ultrasound, 2) pregnancy protection through adequate maternal nutrition, 3) mode of delivery, 4) discordant twins, and 5) assisted reproductive technology. The article also emphasizes the FIGO/WHO concerns regarding safe motherhood and proposes a four point program to reduce perinatal death rates in multiple pregnancy. These elements are: 1) adequate primary health care including access to family planning information and technology, 2) prenatal care with referral of high risk patients to specialized centers, 3) the presence of trained personnel for all women in childbirth, 4) effective access to obstetric care for women who are pregnant, giving birth, or recently delivered.

Key words: Multiple pregnancy, Safe motherhood, Obstetric concerns, Access to care

Medical and lay interest in twins and higher order multiple births clearly is disproportionate to the frequency of their occurrence. This is true in all societies and in all areas of the world. The reasons for this fascination with multiple births are numerous and of long standing, and parallel the attitudes of various cultures over thousands of years. In Greco-Roman times, multiple births were not only objects of curiosity, but were often immortalized in mythology and astrological descriptions, as was the case with Castor and Pollux. During more recent centuries, the public view of twins was often influenced by cultural norms and behaviors that are difficult to assess by modern standards. For example, abhorrence of twins has been reported in areas of the Pacific Basin, including Japan and Australia, as well as in specific parts of Africa. Simultaneously, in some countries, such as Nigeria, twins are often awarded special status. However, regardless of societal attitudes, the easy identification of twins and the excitement associated with the birth of twins and triplets has consistently tended to reinforce medical and scientific

interest in multiple births. Three recent citations from the *Guinness Book of World Records* suffice [5]:

1) The world's most prolific mother, Mrs. Leontina Albina, of Chile, presently age 59, has had 59 children, including five sets of triplets.

2) In 1985, in California, Mrs. Patti Frustaci gave birth to septuplets, the only birth of seven at a time in the United States. This pregnancy, however, was related to the use of fertility drugs.

3) In 1987, in Rome, Mrs. Danny Berg gave birth to a baby girl on December 27; the second twin of the pair was delivered by cesarean section more than one month later, on January 30, 1988.

Situations such as these raise medical questions and stimulate our scientific interest in the factors relating to multiple pregnancy and the care provided to mothers with multiples.

The scientific observation of twins is a relatively new phenomenon. Its origins are diverse, and no single event, person, or medical discipline can be given credit for its present growth and development. From a historical point of view, at least two schools deserve mention for pioneering clinical studies. The Aberdeen School of Twin Studies [10] recently paid tribute to its founders, J.K. Russell and Dugald Baird. In Scotland, Percy Nylander, Ian MacGillivray, and their colleagues have given consistent impetus to the study of twins. At the same time as the Aberdeen school was developing, so was the Italian school, headed by Professor Luigi Gedda and his colleagues at the Mendel Institute in Rome. These individuals set new standards for comprehensive twin research. Their efforts led to the publication of *Studio dei Gemelli* [3] and the most important journal devoted to twin research, *Acta Geneticae Medicae et Gemellologiae*. This same group proposed the founding of the present International Society for Twin Studies.

Recently, Professor Emile Papiernik, of the University of Paris, expressed an opinion about the importance of twin research that is worth quoting: "The care given to twin pregnancies is a mirror of the interest and the concern that society gives to maternal health and welfare" [14]. Those clinician members of the International Society for Twin Studies who have been vitally concerned with prenatal care for twin pregnancies during the past two decades have increased the awareness of the obstetrical community throughout the world, especially in matters of diagnosis and prenatal care.

This interest by the obstetrical community appears to exist, regardless of the twinning rate in various countries. A review of the literature on multiple births reveals publications from regions unrelated to the twinning rate, but related rather to the specific interests of researchers and their access to the international literature. For example, Japan, with its inherently low rate of twinning, compared to, say, the United States or Africa, has provided scientific data on secular changes in twinning rates that can be used by other countries or districts, not only as a means of comparison, but also as a methodologic model [7]. Similarly, Nigeria, with its extraordinarily high rate of twinning, has provided us with an understanding of racial differences in placentation in a single publication [12].

Other countries have made distinct contributions, drawing heavily on their clinical problems and their attempted solutions. French investigators proposed bed rest and work reduction [13]. In the United States, researchers have pioneered efforts to inhibit premature labor by pharmacologic means [1].

GENERAL CONCERNS

There are two topics of particular importance here. The first is a series of general items of recent interest relating to the obstetric care of patients with multiple pregnancy. The second relates to the International Federation of Gynecology and Obstetrics/World Health Organization (FIGO/WHO) concerns regarding safe motherhood.

With regard to the first topic, items of recent interest regarding multiple pregnancy, there are five areas that have international implications, though the list is by no means all-inclusive: 1) diagnosis and ultrasound; 2) pregnancy protection; 3) mode of delivery; 4) discordant twins; and 5) assisted reproductive technology.

The most important aspect of obstetric care for multiple pregnancy is accurate and correct diagnosis. In this regard, clinicians are faced with both good news and bad news. The good news is the emergence in the 1980s of high-quality ultrasound. Without question, ultrasound has been an excellent technological advance in obstetrics. However, the bad news is that in many areas of the world, it is not available. When present, however, it has three distinct roles: 1) detection and verification of the pregnancy; 2) characterization of intrauterine growth patterns; and 3) determination of fetal presentation immediately prior to delivery or after the birth of the first twin.

In the absence of universal ultrasound screening of all pregnancies, popularized by the Swedish school [4], physical parameters must be used and the art of obstetric practice must be emphasized. Even when this art is practiced at its highest degree, physical examination alone cannot document the presence of the "vanishing twin syndrome", a phenomenon whose reality was confirmed by one of our Northwestern medical students in conjunction with associates [8].

After diagnosis, the next point is pregnancy protection. The basis of such protection is good maternal nutrition. It is sad but true that the majority of gravidas throughout the world conceive and give birth under circumstances of less than ideal nutrition. Even when nutrition is adequate, however, no racial or cultural standards exist that define dietary adequacy for women. As yet, there is no international standard for ideal weight gain. Indeed, those standards that previously had been considered ideal, at least in the Euroamerican populations, are being scrutinized severely at this very moment. In the future, it is likely that recommendations for maternal nutrition will be determined for individual women, taking into account high-risk maternal characteristics such as obesity, suboptimal weight, adolescent age, advanced maternal age, primi- or grand-multiparity, and whether or not the patient is a smoker [17]. Specific standards for twin gestations are being developed at the Johns Hopkins University in Baltimore, and these data hopefully will be ready for presentation by 1991 [9]. Although such data are welcome additions to medical practice, unfortunately they will be unmet ideals in most areas of the world.

The third area of concern, mode of delivery of twins, is a matter of lively debate among colleagues in the United States and Europe. The American point of view was summarized and presented at the last congress of the International Society for Twin Studies [2], where the European point of view was also well articulated by Belgian and French experts [15]. Stated simply, vaginal delivery for twins and higher order multiple fetuses probably is prevalent and appropriate throughout the world. The use of cesarean

section has become popular in many industrialized nations for a variety of reasons. There is little question that indications for cesarean delivery have changed in the past decade, with more and more cesarean sections being performed, often for fetal rather than maternal indications. Twin delivery by cesarean section often falls into this category. In this regard, one cannot fault the obstetrician, whose goal is neonatal excellence. What we can do is to collect accurate information for scientific analysis. To date, no prospective randomized multicentric trials have been organized to determine if one or the other method is preferable. It should be noted that in recent years, a new phenomenon has appeared at twin delivery, and this is the frequent performance of cesarean section for the second twin when certain fetal indications exist.

The fourth area of interest is discordant twins. Intrauterine growth often is discordant between the two members of a twin pair. This phenomenon has always been obvious at the delivery table, but ultrasonography permits a thorough documentation of its course during pregnancy. By definition, twins can be considered discordant if the difference in their birthweights is 20-25% or more. Discordance occurs in about 5% of twin pairs. The early detection of discordance is useful because it may lead to appropriate and lifesaving obstetric interventions.

Numerous investigators have used a variety of measurement criteria to establish discordance. These include biparietal diameter of the fetal head (BPD), abdominal circumference (AC), and estimated fetal weight (EFW). In normal situations, biparietal diameter and abdominal circumference measurements do not vary from singletons until the 32nd week of gestation. Early negative variance from normal may be the first sign of discordant growth. In the opinion of Sabbagha and others at Northwestern University [16], the optimal method of assessing the degree of discordance is by estimation of birth weight by formulas targeted to twin pregnancies. The benefits of targeting formulas to specific fetal populations, such as the large fetus or the small for gestational age fetus, have been established in singleton pregnancy.

A rarer form of discordance and one which seldom fails to capture the interest of physicians is the twin transfusion syndrome. The classic description of the morbid anatomy of this condition was described by Schatz from Rostock, Germany, about 100 years ago. When extreme, this problem may result in the so-called "acardiac monster". In most instances with the twin transfusion syndrome, not only is there a marked weight discrepancy between the twins, but one is pale and anemic and the other suffused with rosy color.

The final point of recent interest concerns a general medical and public acceptance of the emergence of assisted reproductive technology (ART). Without question, these efforts, pioneered by Robert Edwards, and his late colleague, Patrick Stepto, have been expanded in virtually every country of the world. Among the most prominent are (in alphabetical order) Australia, France, Germany, Israel, Japan, the United Kingdom, and the United States. Reports of outcome data have appeared and continue to appear on a regular basis in a variety of journals. In general, with in vitro fertilization and embryo transfer, most studies show that the risk of multiple birth is directly related to the number of embryos transferred, rising from 3% with placement of two embryos, to 50% with placement of 6 embryos [6].

There are similar data for all of the assisted reproduction procedures; however, two points must be stressed. The first is that preliminary data from the United Kingdom un-

expectedly have shown that monozygotic splitting, previously considered a biologic constant, is affected by ART [6]. The basis of this interesting observation is presently unclear. The second is the fact that rising number of multiple births, whether based on ART or the ageing of the maternal cohort, as is the case in the United States, is of profound interest to the entire community. It is unfortunate but true that the perinatal death rate for multiple births is, on the average, at least 5 times that of singleton births. Moreover, the morbidity associated with multiple pregnancy is frequent and severe and contributes disproportionately to the staggering total cost of neonatal care and follow-up. This is particularly true in the most developed countries of the world, where neonatology has become a high-technology specialty. These adverse circumstances are directly related to the number of fetuses and are even more ominous for triplets, quadruplets, and higher order multiple births.

A subject that deserves future discussion from both the bioethical as well as the medical perspective is the appearance in maternal and fetal medicine of the concept of selective reduction for higher order multiple fetuses to give the remaining two or three fetuses an enhanced chance for survival to reasonable size and maturity.

SAFE MOTHERHOOD

Among the major international concerns in obstetrics is the wide disparity in perinatal death rates among twins in various locations in the world. Regardless of the country, twins and higher order multiple fetuses have a greatly reduced chance of survival compared to singleton fetuses [10]. In one United States study, the death rate for twins was three times higher than for their singleton counterparts. In Nigeria, the perinatal mortality for twins was four times higher. In all of Scotland, it is 5.8 times greater, whereas in the Aberdeen District it is 4.5 times greater than singleton counterparts.

When perinatal death rates among twins are compared between countries, similar disparities are seen [10]. For example, in Ibadan, Nigeria, the perinatal mortality for twins is virtually twice that in Aberdeen, Scotland. Further, within the Nigerian border, among the Yoruba, the perinatal mortality for monozygotic twins far exceeds that of dizygotic twins. There are many other examples of these striking differences among regions.

Disparities such as these are of concern to clinicians involved in ways to improve maternity services. Both the International Federation of Gynecology and Obstetrics (FIGO) and the World Health Organization (WHO) view these differences as a mandate to further work to assist the medical communities in various parts of the world to provide better health care for all pregnant women. WHO has set a goal of health for all by year 2000. While this may be ambitious, it should be the focal point for medical and political efforts in the decade of the 1990s.

The care given to mothers of twins can be seen as a mirror of society's concern about mothers. There is an urgent need to educate the medical profession and the general public on the value of *safe motherhood*. This is the term used by Dr. Halfdan Mahler, the former Director General of WHO, in his address at a world congress in Nairobi in February 1987. Dr. Mahler vividly assessed the risk of death in pregnancy between the

developing and the industrialized countries. In these latter states, the risk of death varies between 1:4000 and 1:10,000. In contrast, the risk of maternal death varies between 1:15 and 1:50 in developing countries. The excess risk of death in a developing country can be as high as 200 times that in an industrialized nation. This is clearly the widest disparity in all public health statistics.

Stated another way, each year 500,000 women die in childbirth from complications of pregnancy, from problems during delivery, or from illegal abortion. The great tragedy is that the majority of these deaths are preventable. To emphasize this statistic, please consider that this means one death in childbirth per minute, every minute of every hour of every day of the year.

Figures such as these demand special priority status among the leading decision makers regarding health care in the countries of the world. Dr. Mahler summarized the situation well [11]:

“Surely, the most striking fact about maternal health in the world today is the extraordinary difference in maternal death rates between industrialized and developing countries. In the industrialized countries maternal deaths are now rare events... The cause of a maternal death often has some of its roots in a period of a woman’s life preceding the pregnancy. It may be in infancy, or even before her birth, that deficiencies of calcium or vitamin D or iron commence. Continued throughout childhood and adolescence, they result in a contracted pelvis and eventually in death from obstructed labour, or in a chronic iron-deficiency anaemia and often death from haemorrhage. The train of negative factors goes on through the stages of a woman’s life; the special risks of adolescent pregnancy; the maternal depletion from pregnancies too closely spaced; the burdens of heavy physical labour in the reproductive period; the renewed high risk of childbearing after 35, and worse, after 40; the compounding risks of grand multiparity; and running through all this, the ghastly dangers of illegal abortion to which sheer desperation may drive her. All these are like links in a chain from which only the grave or the menopause offer hope of escape”.

Without doubt, there is a connection between the disparities in perinatal death rates for twins and the maternal mortality rates. Whereas it would be illogical to devise a program to specifically reduce perinatal mortality for 1% of pregnant women, it is totally logical to seek to improve maternal care and recognize that the pregnant woman with twins or triplets will benefit accordingly.

The four elements of such a program to reduce perinatal death rates are:

1. *Adequate primary health care*, and an adequate share of the available food, for girls from infancy to adolescence; and *family planning universally available* to avoid unwanted or high-risk pregnancies;
2. After pregnancy begins, *good prenatal care*, including nutrition, with efficient and early detection of medical and obstetric problems, and *referral* of high-risk patients;
3. The assistance of *trained personnel* for all women in childbirth, at home and in hospitals.
4. For women at high risk, and, above all, women in those dire emergencies of pregnancy, childbirth, and the puerperium, effective *access* to the essential elements of obstetric care.

These goals are general in scope, but can be translated into five specific action items. These items are valid in both the developed and the developing countries of the world.

1. We need to use appropriate technologies at all levels so that women have better care at lower cost;
2. We need to strengthen community-based maternal health care delivery systems, upgrade existing facilities, and create relevant new ones if necessary;
3. We need to ensure that pregnant women are screened by supervised and appropriately trained non-physician health workers where appropriate, with relevant technology, to identify those at risk, and to provide prenatal care and care during delivery as expeditiously as possible;
4. We need to strengthen referral facilities and locate them appropriately — hospitals as well as health centers. They need to be equipped to handle emergency situations effectively and efficiently;
5. We need to implement an alarm and transport system that ensures that women in need of emergency care reach the referral facilities on a timely basis.

With these goals in mind, the decision makers and scientists of the International Federation and Gynecology and Obstetrics and the Working Party of Multiple Pregnancy of the International Society for Twin Studies are hoping to make a valuable contribution to the cause of safe motherhood, and to the specialized but important aspect of safe motherhood involving multiple pregnancy.

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