Perinatal outcome of multiple pregnancy in a tertiary maternity hospital in Sudan

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Abstract

Background: The incidence of multiple pregnancies, including high-order multiple pregnancies, has been increasing recently.

Objectives: The objectives of this research were to determine the risk factors and early neonatal outcome of multiple pregnancy.

Methods: This was a descriptive, cross- sectional, hospital-based study, that was conducted in Omdurman Maternity Hospital, during the period January 2015 to August 2015. Two hundred ladies with multiple pregnancy and their respective 428 babies were included in the study. Data was collected using a specifically designed questionnaire and data was analyzed using Statistical Package for Social Sciences (SPSS) program version16. Frequency analysis was used to present the socio-demographic data. Chi square test was used to study the association between the risk factors and type of multiple births.

Results: The result revealed that most of the mothers were between 21-40 years of age and more than half had parity between 2-5; 86% of the mothers had positive family history of multiple pregnancy. The study showed that 87.5% of the deliveries were twins, 11% were triplets and 1.5% were quadruplets. More than two thirds of the deliveries were pre-term and 82% of the babies had low birth weight. Adverse peri-natal outcome included: low Apgar score; neonatal sepsis; respiratory distress syndrome; and hyperbilirubinaemia. The overall mortality rate was 150 per 1000 birth.

Conclusion: Multiple births were found to have an elevated risk of prematurity, low birth weight, and small-for- gestational age. There is need to identify these cases early in order to provide good antenatal care and deliver them in hospitals with facilities for neonatal intensive care.

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Introduction

The incidence of multiple pregnancies, includin ghigh-order multiple pregnancies, has been increasing recently. This dramatic rise is due to more frequent use of ovulation-inducing agents, assisted reproduction techniques and a shift towards bearing children at older maternal ages.[1, 2]

Twin pregnancy has a variable incidence worldwide. Japan has the lowest incidence of 4/1000, whereas African countries have higher incidence of 54/1000 births as reported from Nigeria. [3]

The natural incidence of triplet pregnancies was reported to range from 1 per 6400 to 1 per 9520 pregnancies and that of quadruplet pregnancies, to range from 1 per 537 to 1 per 600 000.[4]

Multiple pregnancy is considered unfavourable due to the poor neonatal outcome, maternal complications, possible long-term developmental problems and high costs involved.[5]

Multiple pregnancies in low income countries like Sudan pose higher foeto-maternal risks due to scarcity of human and material resources, which is in turn reflected into inappropriate care during pregnancy and delivery.[6] As a result, multiple pregnancies in these countries expose mothers and infants to extremely high risks. There is limited information about maternal and foetal complications of multiple pregnancy in Sudan. In a retrospective study done in the central part of Sudan during the period 1985 to 1999, that study included a follow-up of 597 twin pregnancies and 30 triplet pregnancies, had revealed significant maternal and peri-natal mortality with a peri-natal mortality rate of 115/1000 for twin and 223/1000 for triplet pregnancy.[7]

The objectives of this research were to determine the risk factors and early neonatal outcome of multiple pregnancy, and to find out if there is any significant correlation between the risk factors and the type of multiple pregnancy (either twins, triplets or higher order).

Materials and methods

This was a descriptive, cross-sectional, hospital-based study, that was conducted in Omdurman Maternity Hospital which is the largest maternity hospital in Sudan, during the period January 2015 to August 2015.All women with more than, or equal to, 24 completed weeks of gestation, having multiple pregnancy (twins / triplets or higher order) and admitted to the labour ward during the study period, were included.

Those excluded from the study were those who refused to participate. Two hundred ladies with multiple pregnancies and their respective 428 babies were included in the study. Sampling technique was total coverage during the study period.

Data was collected using a specifically designed questionnaire filled-out by the researchers containing maternal and neonatal data. Clinical examination of the newborns was done and they were followed-up for 7 days, to determine early neonatal outcome.

The case definition of multiple births was: twins, triplets or higher – order birth. Independent variables of interest included: maternal factors such as age; level of education; and origin. Obstetric history such as:

antenatal care(ANC) and mode of delivery. Other variables included: parity and mode of conception

(spontaneous; induction of ovulation by using drugs; assisted reproductive technique such as in vitro fertilization (IVF) or intra-cytoplasmic sperm injection(ICSI).

Neonatal outcomes consisted of: pre-term birth (less than 37 weeks of gestation). Low birth weight (less than 2,500 g); very low birth weight (1000- <1,500 g); extremely low birth weight (less than 1000gm).

Small-for-gestation age (determined by birth weight less than the third percentile of expected for gestational age). Birth asphyxia (indexed by Apgar score less than7 at 5 minutes).Suspected neonatal

sepsis (used for septicemia / meningitis and pneumonia). Also, development of respiratory distress syndrome (RDS) which was radiologically confirmed; and hyperbilirubinaemia requiring phototherapy,were included.

Additionally, admission to the Special Care Baby Unit (SCBU) aimed at capturing any other undocumented and undiagnosed morbidities. Neonatal deaths and the cause of death were studied.

Data was analyzed using Statistical Package for Social Sciences (SPSS) program version 16. Frequency analysis was used to present the sociodemographic data . Chi square test was used to study the association between the risk factors and type of multiple births. P value was set on an alpha level at 0.05 level of significance.

Ethical approval for conducting this research was granted by the Ehical Committee of Sudan Medical

Specialization Board as well as Omdurman Maternity Hospital. Prior informed consent was obtained from individual subjects with full explanation of the study.

Results

During the study period, a total of 200 multiple births were enrolled out of a total number of deliveries of 16000 during the study period giving an overall prevalence of multiple pregnancy of 1.25%. The age group distribution of the mothers revealed that 6(3%) were more than 40 years; 95 (47.4%) were between 31-40 years; 95(47.5%) were between 21-30 years and 4 (2%) were less than 20 years old. Regarding the level of education of mothers: those who were university graduates were 50 (25%); those who received secondary school education were 58(29.0%), primary school education in 40 (20.0 %) and 52(26%) were illiterate.

When the parity of the mothers was studied: 21% were primiparous; 26% were multiparous; and 53% had parity between 2-5. Regarding family history of multiple pregnancy: there was family history in 86 % and no family history in 14 % of the mothers. The present study revealed that 94.5% of the mothers were on regular ANC; 3.5% were on irregular ANC; and 2% had no ANC at all. Our data indicated that 175 (87.5%) of the deliveries were twins; 22 (11%) were triplets; and 3 (1.5%) were quadruplets. The mode of pregnancy was: spontaneous in 176 (88.0%) women; induction of ovulation with drugs in 18 (9.0%) ; IVF in 5 (2.5%); and ICSI in 1 (0.5%) woman.

Regarding the mode of delivery: it was spontaneous vaginal delivery in 73 (36.5%); emergency caesarean section in 92 (46%); elective caesarean section in 32 (16.0%); and assisted vaginal delivery in 3 (1.5%).

The gestational age at which the mothers with multiple pregnancy presented to labour was found to be less than 28 weeks in 5 (2.5%), 28 – 34 weeks in 71 (35.5%), 34+1 - 36+6 in 51 (25.5%) and equal to or more than 37 weeks in 73 (36.5%). Figure 1

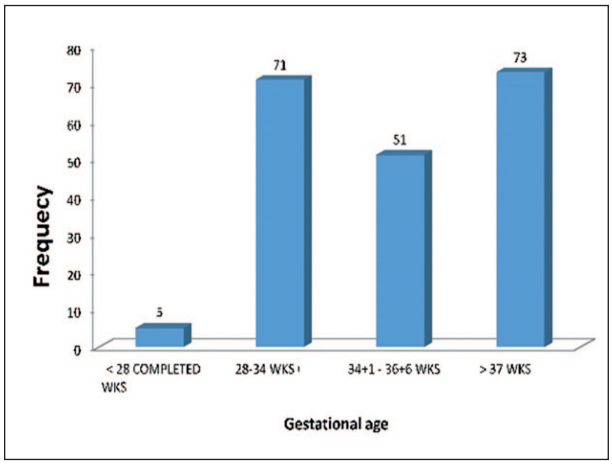

Figure 1:Distribution of mothers with multiple pregnancy according to gestational age

Out of 428 babies, low birth weight was found in 351 (82%). Table (1) illustrates the distribution of babies according to birth weight.

Table 1.Distribution of the babies according to birth weight

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Birth Weight	1st baby	2nd baby	3rd baby	4th baby
< 1 kg	11 (5.5%)	9(4.5%)	1 (4%)	1 (33.3%)
1 - 1.5 kg	48 (24%)	51 (25.5%)	9 (36%)	1 (33.3%)
1.6 - 2 kg	56 (28%)	54 (27%)	14 (56%)	1 (33.3%)
2.1 - 2.5 kg	47 (23.5%)	50 (25%)	1 (4%)	0
> 2.5 kg	38 (19%)	36 (18%)	0 (0.0%)	0
Total	200 (100%)	200 (100%)	25 (100%)	3 (100%)

Small-for-gestational age was found in 128 (29.9%). Birth asphyxia (Apgar score less than 7 at 5 min)

occured in 17 (8.5%) of first babies; 15 (7.5%) of second baby; and in 3 (12%) of third babies. Regarding neonatal admission to the SCBU, there were 124 (62.0%) of first babies admitted to the SCBU; 119 (59.5%) of second babies; 23 (92.0%) of third babies and all of the quadruplets (100%) were admitted to the SCBU. When the neonatal complications were studied, RDS developed in 77(38.5%) of first babies; 73(36.5%) of second babies; 14(56%) of third babies; and all fourth babies (100%).Neonatal sepsis was reported in 38 (19.0%) of first babies; 41(20.5%) of second babies; and 3(12%) of third babies.

Hyperbilirubinaemia requiring phototherapy was observed in 16 (8.0%) of first babies; 19 (9.5%) of second babies; and 3 (12%) of third babies; and all of the quadruplets (100%).

Among multiple birth neonates, there was no deaths reported in the quadruplets, but it was reported in

29(14.5%) of first babies; 31(15.5%) of second babies; and 4(16%) of third babies. The overall mortality rate was 150 per 1000 birth. With regards to the cause of death, in the first, second and third babies RDS (as a cause of death) was reported in 17(58.6%); 17(54.8%); and 2(50%) respectively; while neonatal sepsis was reported in 12(41.4%); 11(35.5%); and one (25%) respectively. Disseminated intravascular coagulation (DIC) was reported in second babies group only and it occurred in one case (3.2%). Stillbirth was reported in one case in second babies only (3.2%). Table 2

Table 2. Distribution of multiple birth babies according to cause of death

Cause of Death	1st baby	2nd baby	3rd baby	4th baby
Respiratory distress syndrome	17 (58.6%)	17(54.8%)	2 (50%)	0 (0.0)
Neonatal Sepsis	12 (41.4%)	12 (38.7%)	1 (25%)	0 (0.0)
stillbirth	0 (0.0%)	1 (3.2%)	0 (0.0)	0 (0.0)
Others	0 (0.0%)	1 (3.2%)	1 (25%)	0 (0.0)
Total	29 (100%)	31 (100%)	4 (100%)	0 (100%)

Our study revealed significant association between mode of pregnancy and type of multiple pregnancy

(P value = 0.00). However, the study didn't find any significant association between family history of multiple births and type of multiple pregnancy (P value = 0.778). Also correlation between age of the mother and type of multiple pregnancy was insignificant (P value = 0.948). The present study didn't reveal any significant association between type of multiple pregnancy and parity (P value = 0.961).

Discussion

Multiple births are much more common today than they were in the past. The present study is an attempt

to determine the risk factors and early neonatal outcome of multiple pregnancy in a tertiary maternity hospital in Sudan. Our data revealed a prevalence rate of multiple pregnancy of 1.25% which is comparable to the figures from other developing countries[8,9]. This could be mainly due to referral of multiple pregnancies to this tertiary hospital for better neonatal care of low birth weight and prematurity.

The present study also showed that 95% of the mothers were between the age group 21-40 years. This is contrary to what is reported in the literature as advanced maternal age is a risk factor for multiple pregnancy, which operates through the hypothalamic-pituitary-ovarian axis and the associated obstetric complications, such as hypertension.[10, 11] More than half of the mothers in our study were either high secondary school or university graduates. This increased risk among this group may reflect their higher economic capacity to access infertility treatments with a greater possibility of multiple gestations.Our data didn't demonstrate any significant association between family history of multiple birth and type of multiple pregnancy. Family history is a well known risk factor for multiple gestation[12]. However this difference in our series may be due to local genetic and environmental factors. Moreover, our data showed that 88% of women conceived spontaneously, which clearly demonstrates that assisted reproductive technique is still not widely-embraced as an option for many women in developing countries for economic and cultural reasons.[13]

More than one third of the mothers in our series delivered prematurely i.e. between 28-34 weeks gestation. Over the last two decades there has been a steady increase in the incidence of preterm births worldwide with a range of 7-13%.[14] One of the reasons attributed to this increase has been the widespread use of assisted reproductive techniques leading to pregnancies with multiple gestations. [15] The higher rate of prematurity in multiple pregnancy can be explained by uterine over-distension and associated complications that require early intervention for termination of the pregnancy.

The present data indicated that 82% of the babies had low birth weight and 29.9% were small-for-gestational age which is in line with other similar studies.[16, 17] Low birth weight and intrauterine growth restriction occur more often in multiple pregnancies. This is due to the higher chance of placental insufficiency as the number of foetuses increase. Growth restriction might also be related to other antenatal complications such as gestational hypertension, which occurs more frequently in multiple pregnancy.[+]

The present study indicated that multiple pregnancies were associated with a range of adverse perinatal outcomes such as RDS; neonatal sepsis; and birth asphyxia(indexed by low 5 minute Apgar score) which is consistent with the findings of other similar studies.[10,18] The overall mortality rate was 150 per 1000 birth. Other studies showed different mortality rates. One study from Hong Kong quoted a mortality rate of 113 per 1000 birth [4]. Another study from Pakistan showed a higher mortality rate of 172 per 1000 birth [5]. One study quoted a lower perinatal mortality rate, of 50 to 60 per 1000 birth [19]. This difference in mortality is due to early diagnosis; better antenatal care; early detection of complications; and facilities for neonatal intensive care.

Conclusion

Multiple births are much more common today than

they were in the past. Multiple births were found to have an elevated risk of prematurity; low birth weight; and small-for-gestational age. These factors significantly contributed to other adverse perinatal outcomes, such as: low five-minute Apgar scores; neonatal sepsis; RDS; and hyperbilirubinaemia. There is need to identify these cases early in order to provide good antenatal care and deliver them in hospitals with facilities for neonatal intensive care.

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