Association of Fetal Gender With Maternal Complications and Pregnancy Outcomes In Primigravida

Safia Bibi,[1*] Khanda Gul,[1] Rozina Khan,[1] Fozia Muhammad Bakhsh[1]

ABSTRACT

Objective — *To determine the association of fetal gender with maternal complications and pregnancy outcomes in primigravida.*

Study design — *Retrospective observational study.*

Place & Duration of study — *Department of Obstetrics and Gynecology Unit 2, Bolan Medical Complex Hospital Quetta, from January 2022 to December 2022.*

Methods — *The clinical records of all the primigravida with singleton pregnancy who visited the emergency ward were reviewed. Variables recorded were sex of the fetus, pregnancy-induced pathologies and fetal outcomes. Data were entered into Microsoft Excel 13 software and analyzed to determine the relationship between the gender of the fetus and various pregnancy outcomes.*

Results — *Out of 1949 babies delivered there were 1009 (51.8%) males and 940 (48.2%) females. Male fetus had increased incidence of eclampsia (p=0.007), emergency cesarean section (p=0.001), elective cesarean section (p=0.04), instrumental vaginal delivery (p=0.04), obstructed labor (p=0.007), meconium stained liquor (p=0.003), stillbirth (p=0.009) and IUGR (p=0.02). Preeclampsia, preterm and post-term births and induction of labor were not statistically significant.*

Conclusion — *The primigravida having a male fetus had a poor pregnancy outcome with a higher rate pregnancy related complications.*

Key words — *Eclampsia, Fetal gender, Maternal complications, Primigravida, Pregnancy outcome.*

INTRODUCTION:

A connection between fetal gender and pregnancy outcomes has been reported in literature.[1,2] There is an evidence that a male fetus has a negative impact on the pregnancy outcomes. This includes increased frequency of preeclampsia (PET), eclampsia, stillbirths and others.[3-8] There is a higher chance of delivery by cesarean sections as well as use of instruments for vaginal deliveries.[9] This phenomenon is still not fully understood.

It is hypothesized that a baby's sex affects the number of metabolites, or tiny molecules, in a pregnant mother's blood. This may explain why a mother's risk of developing certain diseases during pregnancy varies depending on whether she is carrying a male or a female fetus.[10] This study was conducted to determine the relationship between the fetal gender and pregnancy outcome at our institution in order to validate the observations reported in other studies.

METHODS:

Study design, place & duration: This was a retrospective study conducted at the Department of Obstetrics & Gynecology Unit 2, Bolan Medical Complex Hospital Quetta. The hospital records were retrieved of the patients who were managed between

[1] Department of Obstetrics & Gynecology Unit 2 Bolan Medical Complex Hospital Quetta.

Correspondence:
Dr. Safia Bibi [1*]
Department of Obstetrics & Gynecology Unit 2
Bolan Medical Complex Hospital
Quetta
Email: drsafiabibi@gmail.com

January 2022 to December 2022.

Ethical considerations: The study was approved by the ethical review committee of Bolan Medical College Quetta (GD/37/24).

Inclusion criteria and exclusion criteria: The records of all primigravida with singleton pregnancies with 28 weeks of gestation (estimated by the last menstrual period or early ultrasound scan) were included. Multigravida, multiple pregnancies, patients with hypertension, diabetes mellitus, and other medical condition were excluded.

Sample size estimation: All primigravida who visited the emergency labor room for delivery during the study period were included.

Study protocol: The clinical record of all primigravida were retrieved from labour room delivery registers, case sheets and operation theater record registers and reviewed.

Study variables: Study variables for analysis were mode of delivery either vaginal or by cesarean section. Maternal complications and issues like eclampsia, preeclampsia, obstructed labor, instrumental delivery, oligohydramnios, and induction of labor were recorded. Fetal outcomes were noted in terms of prematurity, post-term issues, meconium stained liqor, stillbirth, intrauterine growth restriction (IUGR) and presence of fetal abnormalities.

Statistical analysis: Results were calculated and analyzed using Microsoft Excel 13 program. The Chi-square test was used to compare the maternal and neonatal morbidities between the two the gender groups. Differences were considered statistically significant at the $p < 0.05$.

RESULTS:

During the study year, there were 9578 total births. Out of the total there were 1949 (20.3%) primigravida. According to the gender distribution, there were 1009 (51.8%) male and 940 (48.2%) female fetuses. Majority of women (n=1777 - 91.2%) had a vaginal delivery. There were a total of 159 (8.1%) emergency cesarean sections performed. A statistically significant difference was noted in mode of delivery of male and female babies. Cesarean sections either emergency or elective, were done more frequently in primigravida with male fetuses (emergency cesarean section - p=0.001 and elective cesarean section – p=0.04). Spontaneous vaginal deliveries (SVD) were comparable in both the groups (46.5% vs 44.7% - p=0.2). Details are given in table I. The maternal complications, eclampsia (p=0.007), obstructed labor (p=0.007) and operative vaginal deliveries (vacuum and forceps) with p=0.04, were more common in pregnancies with male babies. Details about neonatal outcome are given in table II.

DISCUSSION:

Pregnancies with male fetuses are at a high risk for number of complications.[11] In this study a significant association was observed between the operative deliveries, either cesarean sections or instrumental deliveries, in pregnancies with male fetus. A similar association has been found in another study.[12] Few researchers concluded that the increased operative deliveries were caused by higher male neonatal birth weights leading to difficult labor. However, in the studies that were adjusted for this variable still showed a significantly higher rates of cesarean deliveries in male fetuses.[13] Previously published research, indicate that this phenomenon appears to have a biological basis and is not influenced by factors such as race, ethnicity, or environmental reasons.[14]

According to our findings, male-bearing women requested cesarean deliveries at a significantly higher rate. This was also reported in a study conducted in China.[15] A meta-analysis has demonstrated that a male fetus raises the mother's risk of preeclampsia / eclampsia.[16] This was also evident in our study as more women with male

Table I: Mode of Delivery (n=1949)

Mode of delivery	Primigravida	Male	Female	p-value
	(n %)	(n %)	(n %)	
SVDs	1777 (91.2%)	906 (46.5%)	871 (44.7%)	0.2
Emergency c/section	159 (8.1%)	94 (4.8%)	65 (3.3%)	0.001*
Elective c/section	13 (0.7%)	9 (0.5%)	4 (0.2%)	0.04*
Total	1949 (100%)	1009 (51.8%)	940 (48.2%)	

*Significant

Table I: Maternal and Fetal Complications

Complications	Male n= 1009 (51.8%)	Female n=940 (48.2%)	p-value
Eclampsia	17 (1.7%)	4 (0.4%)	0.007*
Preeclampsia	09 (0.9%)	4 (0.4%)	0.2
Operative vaginal delivery	97 (9.6%)	75 (7.9%)	0.04*
Obstructed labor	49 (4.8%)	24 (2.5%)	0.007*
Meconium stained liquor	57 (5.6%)	28 (2.9%)	0.003*
Stillbirth	61(6 %)	33 (3.5%)	0.009*
Malpresentation	43 (4.3%)	62 (6.6%)	0.02*
Preterm delivery	15 (1.5%)	10 (1%)	0.4
Post-term delivery	16 (1.6%)	10 (1%)	0.3
Induction of labor	9 (0.9%)	4 (0.4%)	0.2
Oligohydramnios	8 (0.8%)	2 (0.2%)	0.07
IUGR	10 (0.9%)	3 (0.3%)	0.02*
Fetal abnormalities	12 (1.2%)	10 (1%)	0.7
Total	403 (39.9 %)	269 (28.6%)	

*Significant

fetuses had eclampsia which was statistically significant. The frequency of preeclampsia, although increased with male fetuses, but was not significant in our study. In a high-risk cohort study that there was no gender difference for preeclampsia.[17]

Stillbirths were seen significantly higher in male babies in our study. Maternal complications, placental dysfunction (in more than 50% of stillbirth cases), and asphyxia during labor are some of the leading causes of stillbirth. Unfortunately, there is usually no known cause for the majority of stillbirths that occur after 28 weeks of pregnancy. One of the most common risk factors for stillbirth has been identified as male fetal sex.[18] A study of infant mortality in our region found a significantly higher rate of early perinatal mortality in the male babies.[19,20]

The frequency of obstructed labor, meconium stained liquor, intrauterine fetal growth restriction was also more in male fetuses.[21-23] In contrast, one study found no gender disparity in the incidence of preterm IUGR. Males seem more susceptible to maternal anthropometric factors that restrict fetal growth. It suggests additional factors also contribute to fetal growth restriction in either sex.[24] In this study no significant association was found between fetal gender and incidence of preterm births. Similar findings are also reported in other studies.[25,26]

Limitations of the study: This was a retrospective study of one-year duration only from a single unit of a tertiary care hospital. Nation-wide statistics may provide a more holistic data on the subject.

CONCLUSION:

Primigravidae experienced pregnancy complications and poor pregnancy outcomes more often with the presence of male fetuses. Most of the variables studied had significant association with the male gender.

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Authors' contributions:
Safia Bibi: Study conception, data analysis and manuscript writing.
Khanda Gul: Study conception, data collection, manuscript writing and revision
Rozina Khan: Data collection, literature search and manuscript writing,
Fozia Muhammad Bakhsh: Data collection and manuscript writing,

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