Effect of fetal sex on labour and delivery: retrospective review

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The association of fetal sex with pregnancy induced hypertension and pre-eclampsia, the interaction between sex and risk factors for fetal growth restriction, and the increased likelihood of second stage arrest with male sex have all been studied.[1–3] However, a Medline search (1966 to August 2002) using the search terms fetal gender, fetal sex, labour, delivery, and childbirth found no studies on the effect of fetal sex itself on labour outcomes and events. We set out to determine the effect of fetal sex on birth weight, duration of labour, mode of delivery, and birth outcome.

Subjects, methods, and results

In the National Maternity Hospital, Dublin, where the study took place, labour and delivery are actively managed according to a standard protocol.[4] We obtained data from the delivery ward database for the period 1 January 1997 to 31 December 2000 on all primigravid mothers who had a singleton, cephalic fetus and who spontaneously went into labour at term. We confined the analysis to this group to avoid the confounding effects of induced labour and previous parity. We excluded stillbirths, neonatal deaths, and infants with congenital anomalies. We used a χ^2 test with Yates's correction (P values were considered significant at the level of <0.01). Among the variables studied were gestation, need for antibiotics, need for oxytocin augmentation, colour of liquor, need for fetal blood sampling, use of epidural analgesia, duration of labour, and mode of delivery, as well as birth weight.

In the study period 4070 male and 4005 female infants fulfilled the inclusion criteria. Male infants were significantly more likely to require oxytocin augmentation, fetal blood sampling, and instrumental vaginal delivery or caesarean section (table). Female infants were more likely to have meconium stained liquor. There was no statistically significant difference between the sexes in gestation, requirement for antibiotics in labour, or the number of infants with no liquor in labour.

Multiple regression analysis, with adjustment for confounding factors that are known to affect labour and delivery outcome (such as birth weight, duration of labour, and use of epidural analgesia), showed a strong association between fetal sex and birth weight, duration of labour, and mode of delivery. However, mode of delivery was not associated with birth weight.

Effect of sex of fetus on labour outcomes and events. Values are numbers (%) of infants unless stated otherwise

Outcome or event	Male infants	Female infants	P value for difference
Total	4070	4005	
Gestation (weeks)	39.8	39.8	NS
Liquor:			
Clear	2648 (65.1)	2498 (62.4)	NS
Meconium	784 (19.2)	917 (22.9)	<0.0001
None	241 (5.9)	239 (5.9)	NS
Blood stained	397 (9.8)	351 (8.8)	NS
Antibiotics given during labour	370 (9.1)	374 (9.3)	NS
Oxytocin augmentation	2435 (59.8)	2279 (56.9)	0.008
Epidural analgesia	2829 (69.5)	2667 (66.6)	0.005
Fetal blood sample taken	792 (19.5)	662 (16.5)	0.0007
Mean (SD) duration of labour (minutes)	376 (193)	352 (296)	<0.001
Mode of delivery:			
Spontaneous vertex delivery	2896 (71.2)	3064 (76.5)	<0.0001
Lower segment caesarean section	249 (6.1)	170 (4.2)	0.0002
Forceps	324 (8.0)	258 (6.4)	0.009
Ventouse	601 (14.8)	513 (12.8)	0.01
Mean (SD) birth weight (g)	3574 (457)	3453 (435)	<0.001
Destination:			
Ward	3911 (96.1)	3882 (96.9)	NS
Special care baby unit	159 (3.9)	123 (3.1)	NS

Comment

Primigravid women who go into labour spontaneously and at term are more likely to encounter complications during labour and delivery when the infant is a boy. We found no biases in the data studied that could account for the difference; specifically, demographic details of the mothers were similar. Furthermore, the possible confounding effects of parity and induction of labour were removed by confining this analysis to spontaneously labouring primigravid women.

The reason for the impact of fetal sex on birth outcome is unclear. Male infants have a significantly larger head size than female infants, and this may contribute to the duration of labour and the higher incidence of operative delivery.[5] Although we adjusted for birth weight of the infants, we did not consider data on head circumference. However, this factor would not fully explain the sex difference, as duration of labour alone would not account for the increased incidence of suspected fetal distress in males (as evidenced by their increased need for fetal blood sampling). What this study does show is that when we say "it must be a boy" as a humorous explanation of complications of labour and delivery we are scientifically more correct than previously supposed.

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