

Reproductive Risk Factors, Pregnancy Characteristics and Obstetric Outcome in Female Doctors

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Objectives: To compare maternal risk factors, pregnancy characteristics and outcome in female doctors, teachers, and the general obstetric population.

Design: We analyzed obstetric outcomes among 331 female doctors and 656 teachers with singleton pregnancies who gave birth at Fatima Memorial Hospital from March 2000 to December 2006. The general obstetric population (n = 21, 997) was selected as the reference group and logistic regression analysis was used to assess pregnancy outcomes in each group separately.

Results: Reproductive risk factors among female doctors and teachers were similar to those in the general obstetric population with the exception of advance maternal age, number of previous terminations, obesity, infertility treatment and pre-eclampsia. Interestingly, the number of operative deliveries did not vary between the groups. Pregnancy outcome among the doctors and teachers was comparable with that in the general population.

Conclusions: Although doctors and teachers appear to represent a group of health-conscious women, obstetricians don't vary their management of pregnant doctors and teachers during pregnancy and labour.

Keywords:- Pregnancy, Caesarean Section.

In the UK, Geary *et al*¹. observed that female medical doctors when pregnant often choose to deliver by elective cesarean section. Similarly, Lawrie *et al*² reported high cesarean section rates among pregnant medical practitioners in South Africa. The liberal use of caesarean section appears to reflect obstetricians' concern regarding evidence linking vaginal delivery with perineal damage and its long term sequelae such as stress incontinence and anal sphincter damage,³⁻⁵ whereas fear of damage to the infant plays a less significant role in lowering the threshold for cesarean section⁶. To further dissect the impact of a woman's professional status, Persaud *et al*⁷ determined the rate of cesarean section and pregnancy outcome among lawyers in London, and found that they were treated no differently from other women and even had a somewhat lower rate of cesarean section. This study was carried out to assess pregnancy characteristics and outcome in female doctors and teachers.

Methods

Data were collected retrospectively from March 2000 to December 2006 from 331 female doctors and 656 teachers who gave birth to a singleton fetus at Fatima Memorial Hospital, which is a tertiary level perinatal center. This study design was selected to take account of the confounding effect of long term education. Data from 21, 1997 control pregnancies among women representing other occupations were also used in the analysis. Only singleton, structurally and chromosomally normal pregnancies progressing beyond 22 weeks of gestation were included. The documented clinical risk factors included those in the obstetric history and

maternal, obstetric, fetal and labour complications. To record the outcome of pregnancy. We used the following definitions: preterm birth = delivery before 37 completed weeks of pregnancy; per-eclampsia = repeated blood pressure measurements > 149/90mmHg with proteinuria > 0.5g/day; low birthweight = newborn weight <2500g. The child was considered small for gestational age when the sex- and age-adjusted birthweight was below the normal 10th centile according to our own records. If there were two abnormalities, such as low birthweight and preterm delivery, each was considered an independent outcome and was included in both categories. Differences between study subjects and control were tested for significance by χ^2 statistics (dichotomous variables), and, where the minimal estimated expected values was <5, Fisher's exact test was applied. Two - tailed pooled *t* tests were used to analyse continuous variables. Odds ratios and 95% confidence intervals were calculated for reproductive risk factors, pregnancy and delivery characteristics using the programmes SPSS for Windows and Microsoft Excel. Possible confounding variables were identified from background data, obstetric risk factors and health behavior. Multivariate analysis of significant or nearest significant effect (P < 0.1) was based on multiple logistic regression analysis.

Results

The mean maternal ages (SD) were 29.0 years (5.1) in the control group, 31.7 years (3.7) in the doctors (p< 0.001) and 31.4 years (4.2) in the teachers (p<0.001) (Table 1).

The distribution of reproductive risk factors presented separately for each group. When female doctors and teachers were compared with the general obstetric population, maternal risk factors were similar, with the exception of advanced maternal age, number of previous terminations and infertility treatment. Further more, female doctors also had a significantly lower incidence of obesity when compared with the controls or female teachers.

With regards to pregnancy characteristics, case records of women in the study groups were compared against the reference groups (Table 2). Pregnancy and delivery charac-

teristics were similar in the three groups, with the exception of pre-eclampsia, which occurred significantly more often in the reference group and teachers than in female doctors.

Otherwise, the course of pregnancy, including the rate of operative deliveries, was comparable in the groups investigated. In the general obstetric population 47.8% of all caesarean deliveries were elective and the equivalent figures for the doctors and teachers were 52.9% and 47.3%.

The mean birthweight (SD) among those delivering at term (after 37 gestational weeks) was 3604g (493) in the reference group, 3628g (505) among doctors ($P = 0.38$) and

Table 1: Reproductive risk factors in medical doctors ($n = 331$), teachers ($n = 656$) and controls ($n = 21,997$).

Risk factors	Controls n (%)	Doctors n (%)	OR (95 % CI)	Teachers n (%)	OR (95%CI)
Age<18y	83 (0.4)	0	0.4 (0.02 - 6.3)	0	0.2 (0.01 - 3.2)
Age>35y	2586 (11.8)	56 (16.9)	1.5 (1.1 - 2.0)	112 (17.1)	1.5 (1.3 - 1.9)
Primiparity	8659 (39.3)	118 (35.7)	0.8 (0.7 - 1.1)	244 (37.2)	0.9 (0.8 - 1.1)
Previous miscarriage	3850 (17.5)	56 (16.9)	1.0 (0.7 - 1.3)	107 (16.3)	0.9 (0.7 - 1.1)
Prior termination of pregnancy	2270 (10.3)	13 (3.9)	0.4 (0.2 - 0.6)	50 (7.6)	0.7 (0.5 - 0.7)
> 7 deliveries	92 (0.4)	1 (0.3)	0.7 (0.1 - 5.2)	4 (0.6)	1.5 (0.5 - 4.0)
Prior caesarean or uterine surgery	2398 (10.9)	38 (11.5)	1.0 (0.8 - 1.5)	71 (10.8)	1.0 (0.8 - 1.3)
Time since previous delivery >6 years	2171 (9.9)	23 (6.9)	0.7 (0.4 - 1.0)	60 (9.2)	0.9 (0.7 - 1.2)
Prior fetal demise	478 (2.2)	10 (3.0)	1.4 (0.7 - 2.6)	8 (1.2)	0.6 (0.3 - 1.1)
Pregravid BMI>25	5145 (23.4)	45 (13.6)	0.5 (0.4 - 0.7)	125 (19.0)	0.8 (0.6 - 0.9)
Chronic illness	1280 (5.8)	24 (7.2)	1.3 (0.8 - 1.9)	44 (6.7)	1.2 (0.9 - 1.6)
IUCD before pregnancy	1924 (8.7)	28 (8.4)	1.0 (0.7 - 1.4)	56 (8.5)	1.0 (0.7 - 1.3)
Infertility treatment	1387 (6.3)	37 (11.1)	1.9 (1.4 - 2.7)	66 (10.1)	1.7 (1.3 - 2.1)
Maternal diabetes	495 (2.2)	4 (1.2)	0.5 (0.2 - 1.4)	9 (1.4)	0.6 (0.3 - 1.2)
Maternal Pregravid hypertension	428 (1.9)	4 (1.2)	0.6 (0.2 - 1.7)	16 (2.4)	1.3 (0.8 - 2.1)

BMI =body mass index (kg/m^2); IUCD = intrauterine contraceptive device.

Table 2: Pregnancy and delivery characteristics in doctors ($n = 331$), teachers ($n = 656$) and controls ($n = 21,997$).

Characteristics	Control n (%)	Doctors n (%)	OR (95% CI)	Teachers n (%)	OR(95%)
Obstetric cholestasis	136 (0.6)	1 (0.3)	0.5 (0.1 - 3.5)	6 (0.9)	1.5 (0.7-3.4)
Pre-eclampsia	707 (3.2)	3 (0.9)	0.3 (0.1 - 0.8)	18 (2.7)	0.8 (0.5-1.3)
Placenta praevia	120 (0.5)	4 (1.2)	2.2 (0.8 - 6.1)	6 (0.9)	1.7 (0.7-3.8)
Late pregnancy bleeding	124 (0.6)	2 (0.6)	1.1 (0.3 - 4.4)	1 (0.1)	0.3 (0.03-1.)
Isommunisation(Rh)	31 (0.1)	0	1.0 (0.1 - 17.2)	2 (0.3)	2.2 (0.5-9.1)
Low haemoglobin concentration(<100g/l)	324 (1.5)	3 (0.9)	0.6 (0.2 - 1.9)	8 (1.2)	0.8 (0.4-1.7)
Caesarean Section	3669 (16.7)	51 (15.4)	0.9 (0.7 - 1.2)	112 (17.0)	1.0 (0.8-1.3)
Vacuum/forceps	1229 (5.6)	18 (5.4)	1.0 (0.6 - 1.6)	38 (5.8)	1.0 (0.8-1.4)
Induction	3642 (16.6)	45 (13.6)	0.8 (0.6 - 1.1)	107 (16.3)	1.0 (0.8-1.2)
Chorioamnionitis	322 (1.5)	4 (1.2)	0.8 (0.3 - 2.2)	7 (1.1)	0.7 (0.3-1.5)
Meconium-stained liquor	2335 (10.6)	28 (8.5)	0.8 (0.5 - 1.1)	59 (9.0)	0.8 (0.6-1.1)

* t - test (mean, SD).

Table 3: Perinatal outcome. Multivariate regression analysis.

Outcome	Controls n (%)	Doctors n (%)	OR(95%CI)	Teachersn (%)	OR (95% CI)
Admission to a neonatal unit	1620 (7.4)	32 (9.7)	1.40 (0.97 - 2.04)	57 (8.7)	1.19 (0.90 - 1.58)
Fetal death	77 (0.3)	1 (0.3)	1.19 (0.16 - 8.60)	4 (0.6)	1.69 (0.61 - 4.64)
Prematurity (delivery<37 weeks)	1366 (6.2)	16 (4.8)	0.87 (0.52 - 1.45)	28 (4.3)	0.68 (0.46 - 1.02)
Low birthweight (<2500 g)	991 (4.5)	13 (3.9)	0.94 (0.53 - 1.65)	19 (2.9)	0.66 (0.41 - 1.06)
SGA (< 10 th centile)	2044 (9.3)	28 (8.5)	0.99 (0.68 - 1.50)	48 (7.3)	0.82 (0.61 - 1.11)
Low Apgar score (<7 at 1 min)	1059 (4.8)	13 (3.9)	0.88 (0.50 - 1.55)	36 (5.5)	1.19 (0.84 - 1.68)
Low Apgar score (< 7 at 5 min)	398 (1.8)	6 (1.8)	0.94 (0.41 - 2.12)	11 (1.7)	0.93 (0.51 - 1.72)
Fetal venous pH (<7.15 at birth)	238 (1.1)	2 (0.6)	0.59 (0.15 - 2.40)	6 (0.9)	0.88 (0.38 - 1.99)
Perinatal death	43 (0.2)	2 (0.6)	3.43 (0.81 - 14.47)	1 (0.1)	0.79 (0.11 - 5.83)

3607g (495) among teachers ($p=0.85$). Maternal risk factors may confound the risks of adverse pregnancy outcome, so we used logistic regression models to adjust for these factors (Table 3). The incidences of low birthweight or small for gestational age births, prematurity, measures of fetal distress at delivery or need for neonatal intensive care did not vary significantly between the groups.

Discussion

The main finding of the present study was that there was no significant difference in pregnancy outcome between doctors, teachers and general obstetric population. The recent results also indicate that doctors and teachers are treated in an identical manner to other pregnant women. Although the study of this size cannot be relied upon to detect difference in rare complications such as neonatal death ascribable to professional status, the number of cases in the present study is high enough to make statistically valid comparisons with regard to antenatal care offered and commonly used outcome variables.

Overall we found that the doctors and teachers were older than other women. They had a lower number of previous terminations and they were more likely to be infertile. Long term education and health-consciousness are also probable explanations for the observed lower number of terminations. Using multiple regression analysis we found that doctors and teachers had obstetric outcomes comparable with those of the general obstetric population. This indicates that the reproductive risks incurred by advanced maternal age are outweighed by socio-economic and behavioral factors that lower obstetric risks.

The overall risk of pre-eclampsia was significantly lower among doctors than in the general obstetric population. This may have occurred by chance, but on the other hand, obesity is known to predispose women to the development of pre-eclampsia and it is associated with increased lipid availability, increased the delivery of free fatty acids to tissues, and hyperinsulinaemia. The fact that the number of

obese women among doctors was found to be lower than in the general population is in keeping with this finding.

Conclusion

In conclusion, the association is described previously between health professionals and high risk of operative deliveries does not exist. Doctors and teachers appeared to be health conscious as evidenced by their reproductive risk profiles. Obstetricians do not, however, vary their management of labour and delivery for doctors, although theoretically, anxiety in a subject who is a medical doctor herself might result in excessive fetal monitoring and unnecessary interference even in uncomplicated pregnancies.

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