Effect of parity, gravidity, previous miscarriage, and age on risk of Down's syndrome: population based study

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affected births, in spite of the increase in the numbers diagnosed prenatally.

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The increased risk of Down's syndrome with maternal age underlies the recommendation for older pregnant women to be offered screening by amniocentesis or chorionic villus sampling. Recently Schimmel et al suggested that increased parity was an independent risk factor for Down's syndrome, but their study was not population based and did not include terminations of pregnancy.[1]

Using statewide statistics on births and terminations of pregnancy we investigated whether the risk of Down's syndrome is increased independently of maternal age by maternal parity, gravidity, or previous miscarriage.

Subjects, methods, and results

South Australia has around 20 000 births annually. The state collects data on birth defects that include maternal characteristics in both its perinatal and abortion statistics. These statutory collections are complemented by notifications from health professionals to the South Australian Birth Defects Register of defects in children detected within the first 5 years of life and by cytogenetic and necropsy reports. Each case of Down's syndrome included in these collections has been cytogenetically confirmed.

The effects of parity, gravidity, number of previous miscarriages, and mother's age (by single year of age) on risk of having a fetus with Down's syndrome were modelled separately using Poisson regression; then the effects of parity, gravidity, and previous miscarriage were modelled separately after adjustment for the effect of mother's age. Overdispersion was detected in all the Poisson models constructed, and an overdispersion factor was estimated using the square root of Pearson's χ^2 divided by the number of degrees of freedom.[2] The analysis was performed using PROC GENMOD in SAS.[3] Analyses were undertaken for 1986-95 and 1986-90, which was similar to the period of study of Schimmel et al (1981-9) and preceded the gradually increasing use of maternal serum screening for Down's syndrome.

Analysis using births and terminations of pregnancy showed no significant increase in risk for increase in parity or gravidity (table). When only births were analysed for 1986-95, the increased risks with increase in parity (P < 0.001) and gravidity (P < 0.01) were not significant after adjustment for age (P = 0.46 and P = 0.75 respectively); similar results were obtained for 1986-90 for increase in parity. The risk was not increased with the number of previous miscarriages, but the increase in risk with age was constant (P < 0.001).

Comment

Schimmel et al studied live births alone among women of high parity attending one hospital. Their analysis of maternal age by five year age groups might have contributed to spurious results through truncation.[1]

The low risk found in women of low parity may have resulted from the inadvertent exclusion of women of low parity who had had Down's syndrome diagnosed in their fetus prenatally elsewhere and spontaneously miscarried or terminated the pregnancy.[1] Another Australian population based study found that older pregnant women who had had three or more previous births were less likely than those of lower parity to undergo amniocentesis or chorionic villus sampling, although all were eligible for a medical service rebate.[4] We found a similar differential use of prenatal diagnosis in univariate analysis among South Australian women who were pregnant in 1991-6 (odds ratio 0.55 (95% confidence interval 0.51 to 0.61)) and also found a similar higher use of these tests among women who had had a previous termination of pregnancy. These and other differences identified may reflect different degrees of knowledge about the availability of tests, concern about the possibility of having a disabled child, or attitudes towards termination of pregnancy.[4]

With the operation of selection factors and increasing use of prenatal diagnosis, risk estimates of Down's

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Relative risk (per unit increase in variable) of Down's syndrome for age, parity, gravidity, and previous miscarriage, 1986-95 and 1986-90, South Australia

Variable	Births and terminations				Births only			
	1986-95 (284 cases of Down's syndrome, 197 912 births)		1986-90 (128 cases of Down's syndrome, 98 561 births)		1986-95 (171 cases of Down's syndrome, 197 912 births)		1986-90 (100 cases of Down's syndrome, 98 561 births)	
	Relative risk (95% CI)	P value	Relative risk (95% CI)	P value	Relative risk (95% CI)	P value	Relative risk (95% CI)	P value
Univariate analysis								
Age	1.202 (1.142 to 1.266)	0.0001	1.170 (1.097 to 1.247)	0.0001	1.129 (1.103 to 1.155)	0.0001	1.131 (1.099 to 1.165)	0.0001
Parity	1.256 (0.997 to 1.581)	0.0769	1.260 (0.946 to 1.677)	0.1461	1.235 (1.105 to 1.380)	0.0006	1.245 (1.078 to 1.438)	0.0059
Gravidity	1.176 (0.988 to 1.398)	0.0931	1.168 (0.940 to 1.452)	0.1944	1.131 (1.036 to 1.235)	0.0099	1.107 (0.977 to 1.254)	0.1269
Previous miscarriage	1.148 (0.769 to 1.715)	0.5307	1.066 (0.599 to 1.896)	0.8338	1.078 (0.849 to 1.370)	0.5526	0.883 (0.559 to 1.394)	0.5751
Multivariate analysis								
Parity and age:								
Parity	0.964 (0.777 to 1.196)	0.7378	0.990 (0.751 to 1.306)	0.9442	1.038 (0.942 to 1.145)	0.4554	1.032 (0.912 to 1.168)	0.6215
Age	1.206 (1.142 to 1.273)	0.0001	1.171 (1.093 to 1.254)	0.0001	1.125 (1.098 to 1.153)	0.0001	1.128 (1.094 to 1.163)	0.0001
Gravidity and age:								
Gravidity	0.961 (0.810 to 1.141)	0.6463	0.972 (0.778 to 1.215)	0.8006	0.987 (0.909 to 1.071)	0.7541	0.949 (0.846 to 1.065)	0.3637
Age	1.208 (1.143 to 1.276)	0.0001	1.173 (1.095 to 1.258)	0.0001	1.130 (1.102 to 1.159)	0.0001	1.138 (1.100 to 1.177)	0.0001
Previous miscarriage and age:								
Previous miscarriage	0.929 (0.642 to 1.344)	0.6865	0.875 (0.516 to 1.483)	0.6003	0.933 (0.777 to 1.121)	0.4480	0.743 (0.529 to 1.044)	0.0584
Age	1.205 (1.142 to 1.270)	0.0001	1.173 (1.098 to 1.254)	0.0001	1.131 (1.103 to 1.159)	0.0001	1.138 (1.098 to 1.179)	0.0001

syndrome need to be based on population data that include births and terminations of pregnancy.

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Bullying in schools: self reported anxiety, depression, and self esteem in secondary school children

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continued over

Evidence exists of considerable problems with bullying and bullied children in secondary schools. In the largest survey in the United Kingdom to date 10% of pupils reported that they had been bullied "sometimes or more often" during that term, with 4% reporting being bullied "at least once a week."[1] The impact of the introduction of policies on bullying throughout a school seems to be limited.[1] The commonest type of bullying is general name calling, followed by being hit, threatened, or having rumours spread about one.[1] Bullying is thought to be more prevalent among boys and the youngest pupils in a school.[2]

We are unaware of any study that has examined the mental health problems of children who are being bullied. We assessed self reported anxiety, depression, and self esteem in bullied children and those who were not bullied and in bullies and those who were not bullies.

Subjects, methods, and results

Four questionnaires (the Olweus bully/victim,[2] the short mood and feelings,[3] the revised children's manifest anxiety incorporating a lie scale,[4] and the Rosenberg self esteem[5] questionnaires) were anonymously completed by 904 pupils aged 12-17 in years 8-11 in two coeducational secondary schools. School A is a non-selective school in a socially disadvantaged urban area. School B is a rural grant maintained school in an area with a higher than average proportion of high social class households.

Logistic regression models were fitted to the proportions of bullied or bullying children using STATA. Categorical variables were school, school year, and sex. Anxiety, lying, esteem, and depression scores were treated as continuous variables. The table shows the odds ratios of the fitted logistic regression models.