

# Increased birth weight in northerly islands: is fish consumption a red herring?

Valerie Harper, Ronella MacInnes,  
Doris Campbell, Marion Hall

Department of Obstetrics and Gynaecology, University of Aberdeen, Aberdeen AB9 2ZD

Valerie Harper, MRCOG, research fellow  
Doris Campbell, FRCOG, senior lecturer  
Marion Hall, FRCOG, clinical senior lecturer

Health Centre, Kirkwall, Orkney  
Ronella MacInnes, DRCOG, general practitioner

Correspondence to: Dr Harper.

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Babies born to residents of the Faeroe Islands have been reported to be heavier than babies born to other Scandinavians and international averages.<sup>1</sup> No explanation for this finding was given, but it has since been suggested that the increase in birth weight may be due to the high dietary intake by the Faeroese of (n-3) polyunsaturated fatty acids from fish.<sup>2</sup> To investigate this further we compared the birth weights of live singleton infants born to mothers resident in the Orkney Islands with the birth weights of similar infants born to mothers living in Aberdeen, on the Scottish mainland. Determinants of birth weight were compared in the two populations. The Orcadians eat 30% more fish than the Aberdonians<sup>3</sup> (A Anderson and A Walker, personal communication).

## Patients, methods, and results

Singleton live births to women resident in Orkney (n=899) during 1980-4 were identified from the Scottish morbidity record 2, and information was extracted from the case notes by one observer (RM). Residents of Orkney who delivered in Aberdeen during this period (n=116) were identified, and data were extracted from the Aberdeen maternity and neonatal databank. All singleton live births to women resident in Aberdeen City district in 1982 (n=2997) were chosen as controls. The information obtained for each birth consisted of maternal parity, age, height, weight at 20 weeks' gestation, smoking habit, marital status, complications of pregnancy, birth weight and sex of the infant, and gestational age at delivery. Data were analysed with the statistical package for the social sciences X. The *z* test was used to compare the mean maternal age, height, weight, number of cigarettes smoked by smokers, birth weight of the infants, and gestational age at delivery. The number of smokers, distribution of parity, marital status, and birth weight centiles were compared with the  $\chi^2$  test. Birthweight standards used were derived from Aberdeen City district deliveries.

During 1980-4 the mean birth weight of the babies born to women resident in Orkney was 3521 (SD 504) g and that of the babies born to women resident in Aberdeen was 3287 (544) g. The proportion of male

infants delivered to the two groups was the same. Gestational age was prolonged in the Orkney women by 0.36 weeks. Altogether 186 (18.3%) babies in Orkney were over the 90th centile for birth weight corrected for gestational age at delivery and parity compared with 300 (10.0%) babies in Aberdeen; 49 (4.8%) babies in Orkney were below the 10th centile compared with 365 (12.2%) babies in Aberdeen. The women in Orkney were taller and heavier than the women in Aberdeen: mean heights were 161 (6.1) cm and 160 (6.1) cm respectively, and mean weights at 20 weeks' gestation were 66.34 (10.3) kg and 62.2 (10.2) kg, respectively. The women in Orkney were slightly older (mean age 27.0 (5.1) years) than the women in Aberdeen (mean age 26.2 (4.9) years). Altogether 332 (36.9%) of the women in Orkney were primigravidae compared with 54 (46.2%) of the women in Aberdeen. A smaller proportion of women in Orkney smoked (148 (16.5%) compared with 48 (41.4%) of women in Aberdeen), and the mean number of cigarettes smoked per day by the smokers in Orkney was lower (9.3 (7.0) compared with 14.9 (7.1)).

The differences between the above variables were significant at the 1% level. The effect of each variable on birth weight was determined by a multiple regression analysis in a stepwise manner (table). The variables maternal age and marital status were also tested but did not affect birth weight significantly.

## Comment

Birth weights of babies born to residents of Orkney are significantly higher than those of babies born to residents of Aberdeen City district even after correction for gestational age at delivery and parity. The small difference in gestational age may be due to the higher proportion of mothers in Aberdeen who smoke as smoking shortens the period of gestation by 0.2-0.4 weeks.<sup>4</sup> Most of the difference in the weight of babies of residents of Orkney and Aberdeen can be explained by the differences in maternal weight, height, and smoking habit. A small but significant proportion of the variation in birth weight was explained by the mother being a resident of Orkney. This may be due to genetic or environmental factors such as diet. Any hypothesis concerning dietary causes of increased birth weight must take into account other known determinants of birth weight.

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### Steps in multiple regression analysis of birth weight

Variable	R <sup>2</sup>	Regression coefficient	Standard error	F	F change
1 Gestation	0.371	165.1	4.0	1556	
2 Maternal weight at 20 weeks	0.418	7.9	0.8	946	212.2
3 Mother a smoker or not	0.449	-186.2	17.4	717	151.2
4 Sex of baby	0.465	-141.7	16.1	573	77.4
5 Parity	0.479	72.7	8.6	484	71.1
6 Maternal height	0.487	8.9	1.4	417	41.8
7 Residents of Orkney	0.489	62.4	18.6	360	11.2

All F values and F changes were significant.

1 Olsen SF, Joensen HD. High liveborn birthweights in the Faeroes: a comparison between birthweights in the Faeroes and in Denmark. *J Epidemiol Community Health* 1985;39:27-32.

2 Olsen SF, Hanson HS, Sorensen TIA, Senses B, Secher NJ, Sommer S, et al. Intake of marine fat, rich in (n-3) polyunsaturated fatty acids, may increase birthweight by prolonging gestation. *Lancet* 1986;ii:367-9.

3 Barber SA, Ball NG, Cameron AM. A dietary survey of an isolated population in the UK. The islanders of Orkney. *Human Nutr Appl Nutr* 1986;40A:462-9.

4 Pirani DH, Pirani BBK. Smoking during pregnancy. *Obstet Gynecol Surv* 1978;33:1-13.

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