

Letter to the Editor

Role of Sex in Familial Aggregation of Blood Pressure in Young Families

To the Editor:

Familial aggregation of blood pressure in children has been studied in different populations and in different countries. However, the literature has shown inconsistent results. Various patterns of parent-child resemblance have been reported, e.g., equal parent-child correlations with no influence of sex, or greater same-sex parent-child correlations or greater opposite-sex correlations, as well as no consistency in sib-sib correlations [Schieken, 1993; Wilson et al., 1992].

We performed an analysis based on a community-based family study, which has been detailed previously [Chen et al., 1996, 1997]. Briefly, young families were ascertained through parents who reported to have at least one child between age 6–17 years living in the town of Humboldt, Saskatchewan, in 1993. After excluding step- and adopted offspring, we identified 214 young families with both parents who participated in the study and 95 families in which only one parent participated. All the data of 1,045 individuals from 309 Caucasian families were used in this analysis. The collection of questionnaire information and measurements of blood pressure, height, and weight have also been detailed elsewhere [Chen et al., 1995].

Familial correlations were computed using the FCOR program of the S.A.G.E. (Statistical Analysis for Genetic Epidemiology) [1994] software package under two weighting methods: 1) equal weight to pairs, and 2) equal weight to nuclear families. Body mass index (BMI) was calculated as weight (kg)/height (m)². Adjustment for the effects of age and BMI on blood pressure was performed separately within groups (fathers, mothers, sons, and daughters).

Table I shows the familial correlations of systolic and diastolic blood pressures (weighted to pairs). For systolic blood pressure, the parent-child correlations were no longer significant after adjustment for the effects of

TABLE I. Familial Correlations of Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) in 309 Young Families

	No. of pairs	Crude		Adjusted ^a	
		SBP	DBP	SBP	DBP
Spouse	210	0.089	0.066	−0.019	−0.000
Parent-child					
Mother-daughter	245	0.181 ^c	0.201 ^c	0.078	0.115 ^b
Mother-son	245	0.134 ^b	0.079	0.096	0.043
Father-daughter	192	0.143 ^b	0.050	0.071	−0.000
Father-son	205	0.103	0.021	0.039	−0.075
Sib-sib					
Sister-sister	77	−0.042	0.179	0.165	0.213 ^b
Sister-brother	135	0.107	−0.070	0.088	−0.043
Brother-brother	76	0.104	0.252 ^b	−0.154	0.038

^aAdjusted for effects of age and body mass index in fathers, mothers, boys, and girls separately.

^bDifference from zero ($P < 0.05$).

^cDifference from zero ($P < 0.01$).

age and BMI, and the sib-sib correlations were not significant either. For diastolic blood pressure, only mother-daughter and sister-sister correlations were significant and others were not, after age and BMI were taken into consideration. However, the overall parent-child and sib-sib correlations for diastolic blood pressure were only 0.025 ($P > 0.05$) and 0.051 ($P > 0.05$) after adjustment for the effects of age and BMI. Correlations weighted to nuclear families showed similar results, which are not presented.

Relative body weight is an important predictor of blood pressure [Chen et al., 1995]. There was strong familial resemblance of relative body weight in this population (unpublished data), which accounted for, at least in part, the crude familial resemblance of systolic blood pressure. In addition, a suggestion that possible gene effects are sex- and age-dependent, with smaller effects on younger persons [Schieken, 1993], could also be a reason for the lack of familial aggregation of systolic blood pressure in these young families. For diastolic blood pressure, mother-daughter and sister-sister correlations were significant, but were of relatively low magnitude, and overall parent-child and sib-sib correlations did not reach statistical significance. Our data provided evidence of sex-related differences in familial correlations of diastolic blood pressure. There is no convincing evidence for sex differences in the genetic regulation of blood pressure as yet [Schieken, 1993]. It is also not known whether common

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environmental factors play different roles in females as compared to males. Variations of familial aggregation of blood pressure from one population to another also require further investigation.

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