影響學齡前兒童血脂質因子之研究

Affecting Factors ob Blood Lipids of Preschool Children

中文摘要

本研究目的是為了解影響學齡前兒童血脂質之因子，故探討體位、營養素攝取對血清脂質和脂肪酸的影響，並分析母子間血清脂質的遺傳特性。

從民國 86 年 2 月到 89 年 5 月共取得台北市 2,102 位 3－6 歲學齡前兒童的身高和體重，從中計算出身體質量指數，並得到 85 百分位和 95 百分位的切點作為過重和肥胖的指標，以便進行後續研究。其中取樣 354 位（由 11 個行政區，18 所學校）作進一步血清脂質資料分析，取得 252 份生活背景問卷、112 份飲食紀錄和 43 份血清脂肪酸資料。在進行分析母子間血清脂質之受試者，取得 208 位學齡前兒童，並得 111 位受試者的母親、57 位受試者的同胞手足。

取得 2,102 名男、女兒童體位值分布，依身體質量指數（BMI）85 百分位為過重之指標，得 3、4、5 與 6 歲各年齡層之男童之值分別為 17.80、18.00、18.58、18.71；女童分別為 17.84、17.91、18.08、17.86。依 95 百分位為肥胖之指標，其值在各年齡層之男童分別為 19.13、20.18、20.88、21.28；在女童則分別為 18.78、18.78、20.46、19.58。

354 位兒童血清脂質之研究，結果膽固醇濃度的平均值為 168 mg/dL，95 百分位為 218mg/dL。以 t-test 檢定，發現高脂質組中的醣類攝食量和熱量中所佔的百分比與粗纖維質的攝食量都顯著偏低，飲食中膽固醇的攝食量顯著偏高。以多變項迴歸分析，得粗纖維進食量對血清飽和脂肪酸（r=0.43, p=0.024）、單元不飽和脂肪酸（r=0.49, p=0.038）、多元不飽和脂肪酸（r=0.46, p=0.012）具有顯著影響。

從親裔迴歸分析進行 111 對母子及 57 對同胞手足血清脂質的遺傳性之特性研究，發現到膽固醇、低密度脂蛋白膽固醇在母親、學齡前兒童和同胞手足等三個族群中得到的遺傳率各別在 0.75~1.0 和 0.77~1.0。又膽固醇、三酸甘油酯、高密度脂蛋白膽固醇、低密度脂蛋白膽固醇等數值的關係在受試者和同胞手足間有顯著差異性存在，顯示膽固醇、三酸甘油酯等血脂質是分別受到基因不同程度的控制。

本研究首創得到台北地區學齡前兒童身體質量指數（BMI）值的分布，並求得 85 百分位、95 百分位為過重和肥胖的身體質量指數值。所取得學齡前兒童的血清脂質分布是為國內首創可以作為國內兒童血清脂質的標準值參考。並首次在國內以遺傳、基因的評量角度了解母子間血脂質的遺傳特性。

英文摘要

The purpose of this study is to investigate the determining factors of the blood lipids of preschool children by examining the association between anthropometry, nutrients intake and serum lipids and fatty acids, and by exploring the correlation of serum

lipids among mothers, offspring and siblings. A total of 2,102 preschool children, aged from 3 to 6, were recruited from kindergartens in Taipei from February 1997 to May 2000. The weight and height were measured on 2,102 subjects. Out of 2102 subjects, 354 serum lipid samples from 18 schools (11 districts), 252 questionnaires of children's background information, 112 food intake records, and 43 serum fatty acids profiles were collected.

The 85th percentile cut-off point of BMI (defined as overweight) at the age of 3, 4, 5, 6, are17.80, 18.00, 18.58, 18.71 for boys and 17.84, 17.91, 18.08, 17.86 for girls. The 95th percentile cut-off point of BMI (defined as obesity) at the age of 3, 4, 5, 6 are 19.13, 20.18, 20.88, 21.28 for boys and 18.78, 18.78, 20.46, 19.58 for girls.

The mean of total serum cholesterol level is 168 mg/dL and its 95th percentile value is 218 mg/dL (N = 354). High fat and lower fiber intake has limited effect on the serum lipid profiles. By contrast, crude fiber intake have significant impact on the level of saturated fatty acids in serum（r=0.43, p=0.024）, PUFA（r=0.49, p=0.038）, MUFA（r=0.46, p=0.012）.

By conducting parent-offspring regression analysis on 111 mother-child and 57 sibling pairs, higher hereditability of four types of serum lipids was revealed. Furthermore, our study discloses that the serum lipid profile of the children in Taipei have a significant correlation with that of their parents, which may be under the genetic control.

This is the first study conducted in Taiwan to establish the distributions of both BMI and serum lipids for preschool children. The data acquired from these studies will serve as invaluable references for future researches. This study is also the first investigation aimed at understanding how heredity may play a role on the metabolic control of serum lipids.