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Geneva Study on the Precursors of Atherosclerosis: First Results

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INTRODUCTION

It is believed that the first manifestations of risk factors of cardiovascular disease may be detected in early childhood. The end of adolescence marks the critical period when the risk factors tend to become permanent. Among the risk factors, arterial blood pressure and blood lipid content seem to be of particular significance, whereby their respective statistical distributions vary from one population to another. These distributions are unknown for the population of Geneva. Therefore, it seemed of interest to present some raw results obtained in the course of a cross-sectional epidemiologic study covering the population of adolescent schoolchildren attending state school, and dealing with the set of risk factors and their statistical intercorrelations.

MATERIAL

The population sample from which the following results were established includes 100 14-year-old male children and 100 14-year-old female children of Swiss nationality (cohort of 1963). The sample was drawn from the population of lower (blue-collar) socioeconomic status. The total participation (i.e., the proportion of children whose parents responded favorably to the letter of invitation to participate in the study) amounts to 30 %. The sampling fractions (number of children examined/ the corresponding population) for diastolic blood pressure amount to 19 % for males, 21 % for females; for HDL cholesterol, 7 % for both males and females; and for all other measures, 23 % and 21 % respectively for males and females.

The examinations were conducted during the school year of 1977/1978 in the "Service de Santé de la Jeunesse" in the canton of Geneva, Switzerland.

METHODS

Other than the anthropometric measurements performed, the following examinations were undertaken.

1. Arterial blood pressure

For all children, the arterial blood pressure was taken following a general medical examination at least one-half hour after the subjects had breakfasted. Room temperature was held constant and each subject was in the supine position, with the upper body elevated from the horizontal at an angle of 40 degrees. The child wore light undergarments and blood pressure was taken following a 5-10 minute rest period. During the actual measurements, the lower right arm of the child was raised at an angle of 45 degrees in relation to the body. The cuff, with an inflatable capacity of 12/22 cm., was placed on the upper right arm in such a way that it was consistently 2-3 cm. above the antecubital space; the stethoscope was placed over the brachial artery. The cuff was inflated until approximately 240 mm. Hg, and its immediate deflation followed a run-down of 2 mm. per second on the mercury dial.

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The measurements of systolic and diastolic blood pressure were read respectively at the first and the fifth Korotkoff sounds. Hawksley's "Random Zero Sphygmomanometer" was utilized for the entire set of blood pressure measurements. The true values for blood pressure are obtained by deducting the baseline value, indicating the zero for the measurement, from the respective values read on the manometer. Blood pressure measurements were taken twice for each subject, the second being taken within a 2-3 minute interval following the first.

2. Blood lipid measurements

The blood samples were taken in the morning between 8 and 9 a.m., following a 5 minute rest period in supine position. All subjects had fasted for at least 12 hours. The blood was collected following a short venostasis. Special vacutainous syringes (Sarstedt's no. 263). were utilized. These syringes countain small plastic granules that allow a rapid coagulation of the blood at room temperature, and avoid the transfer of the material to another tube prior to centrifugation.

a) Cholesterol content and its lipoprotein fractions (i.e., HDL) were determined by the direct enzymatic method. The set of procedures used for ultracentrifugation were conducted following the recommendation of K. Carlson (1). Regular quality controls were carried out on the basis of serum exchange with the Chemical Laboratory Inselspital Berne as well as with the Kantonsspital in Basel.

b) Triglycerides were measured according to Soloni's method (3). For triglycerides and lipoprotein fractions, the quality controls were performed in collaboration with other European laboratory centers, as previously published (2).

RESULTS

Among the results that have been established to date, the following presents the distributions and principal parameters of systolic blood pressure (fig. 1), diastolic blood pressure (fig. 2), total cholesterol (fig. 3), HDL cholesterol (fig. 4) and triglycerides (fig. 5).

Fig. 1

SYSTOLIC BLOOD PRESSURE

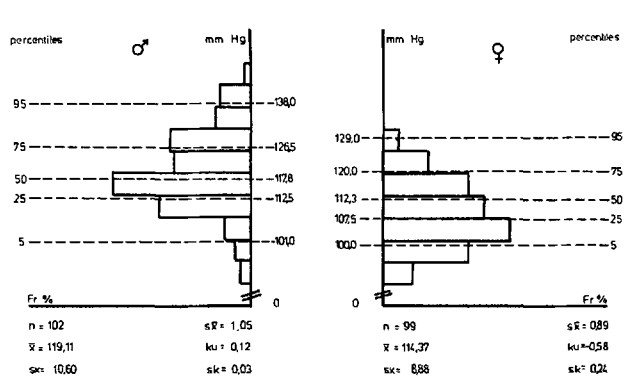


Fig. 2

DIASTOLIC BLOOD PRESSURE

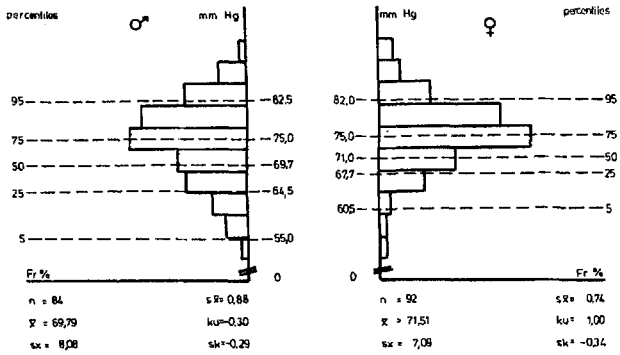


Fig. 3

TOTAL CHOLESTEROL

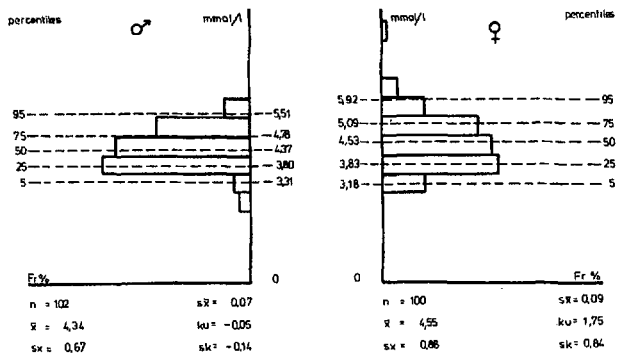
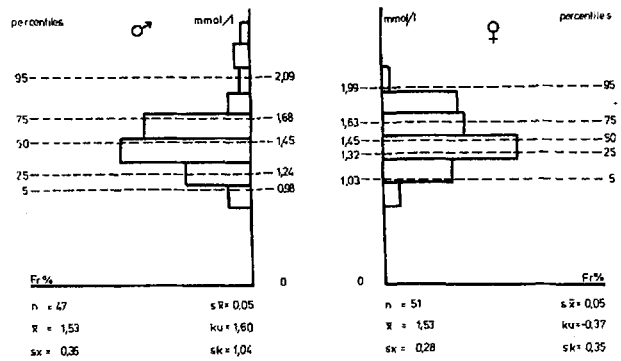


Fig. 4

CHOLESTEROL HDL



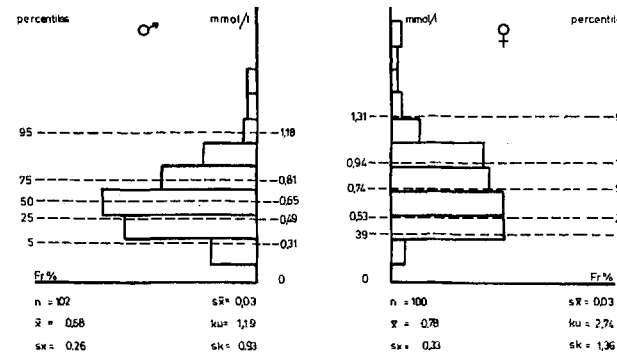
ZUSAMMENFASSUNG

Genfer Studie der Vorläufer kardiovaskulärer Erkrankungen: erste Resultate

Im Rahmen einer Studie zur Erfassung von Risikofaktoren die möglicherweise zu kardiovaskulären Erkrankungen im späteren Lebensalter führen, wurde eine Gruppe von 14-jährigen Schweizer Schülern und Schülerinnen untersucht. Diese Untersuchung erfolgte im Schuljahr 1977/1978 im Rahmen des schulärztlichen Dienstes. Die statistische

Fig. 5

TRIGLYCERIDES



Verteilung folgender Faktoren wird präsentiert: systolische und diastolische Blutdruckwerte, das Gesamtcholesterol, die Triglyceride, sowie die Lipoproteinfraktion "HDL" des Cholesterols.

RESUME

Etude genevoise des précurseurs des maladies cardiovasculaires: premiers résultats

Dans le cadre d'une étude sur les facteurs précurseurs des maladies cardiovasculaires, un échantillon de la population scolarisée âgée de 14 ans, d'origine suisse, a été examiné au cours de l'année scolaire 1977-1978. Les distributions observées des facteurs suivants sont présentées: tension artérielle (systolique et diastolique) cholestérol, HDL-cholestérol et triglycérides.

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