Screening secondary school students in the Gaza strip for β-thalassaemia trait

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Summary

A small scale screening study for β-thalassaemia trait has been carried out in the Gaza Strip, involving 1650 secondary schools healthy students, 16–18 years old and from both sexes. The results showed that the overall prevalence in the Gaza Strip of β-thalassaemia was 4.3%. The frequency of β-thalassaemia trait in the microcytic (defined as MCV ≤ 80fl and/or MCH ≤ 26 pg) subjects was 27.1%. The efficacies of some of the proposed discrimination functions in the differentiation between β-thalassaemia trait and non-thalassaemic microcytosis were evaluated. The Mentzer index, MCV of ≤ 72fl, England & Fraser DF and the Shine & Lal formula were found to correctly identify 91.6%, 82.4%, 81.3% and 62.6% of the studied cases of microcytosis as having or not having the β-thalassaemia trait. It was concluded that both β-thalassaemia and microcytic anaemias are major health problems in the Gaza Strip. The various forms of consanguineous marriages, in addition to poor economic conditions in the Gaza Strip may have contributed to the concentration of β-thalassaemia and the prevalence of microcytic anaemias in this population.

Keywords β-thalassaemia trait, iron deficiency, mathematical formulas, microcytosis, Gaza Strip

Introduction

The carrier states (heterozygotes) for thalassaemias are usually clinically silent, while the homozygotes and double heterozygotes states may have major clinical implications. It is essential to be able to detect and identify the carrier states (The Thalassaemia Working Party of the BCSH General Haematology Task Force 1994). β-thalassaemia is widely spread throughout the Mediterranean and the Middle East (Weatherall & Clegg 1981; Munshi et al. 1989; Sheriff et al. 1989; Huisman 1990; Bashir et al. 1992) but there has been no study to determine the prevalence of β-thalassaemia trait among the Gaza Strip population, in which consanguineous marriages are common. At the time of this study there were 210 blood transfusion dependent β-thalassaemia major patients registered at the four thalassaemia blood transfusion centres in the Gaza Strip (Palestinian Ministry of Health 1997; United Nations Gaza Center 1997).

The present study is the first ever organized in the Gaza Strip. In this we aimed to investigate microcytosis (defined as MCV ≤ 80fl and/or MCH ≤ 26 pg) among 1650 secondary schools healthy students and to determine the prevalences of β-thalassaemia trait and non-thalassaemic microcytic anaemias. The efficacies of various formulae and discrimination functions (England & Fraser 1973; Mentzer 1973; Shine & Lal 1977; and MCV of ≤ 72fl) proposed to discriminate between patients with β-thalassaemia trait and patients with various non-thalassaemic causes of microcytosis are discussed.

Subjects and methods

The Gaza Strip in Palestine on the shores of the Mediterranean covers 365 km² with an estimated population of 963 000 (Palestinian Central Bureau of Statistics 1996). The subjects, 1650 secondary school students aged 16–18 years old, were unrelated or at least not closely related. The subjects represented 45 classes of the scientific division of 18 schools of the five governorates. There were 832 males and 818 females. The sample size from each governorate was proportional to its population size. The schools within each governorate were chosen by simple random sampling, and all the students in each chosen class were screened.

A 60 minute lecture was given to each class one day before blood sampling to educate the students about the inherited diseases in general and about the thalassaemias...