metals, including lead.[4,5] Iron-deficiency anemia is associated with conditions that may independently affect infant and child development [e.g. low birth weight, generalized under nutrition, poverty and high blood level of lead]. [6]

In children, severe anemia can impair growth and motor and mental development, possibly irreversibly. A study performed in 1997 found that 10 to 13 years old children who had been severely iron-deficient during their infancy scored lower than normal children in all subjects, but particularly in written expression. They also tended to have more behavioral, general health and emotional problems. Another study reported that teenage girls with iron-deficiency, even without anemia, may have temporary memory and concentration loss. [1]

Young children require adequate amounts of iron for optimum health, physical and cognitive development. They are at high risk of iron deficiency anemia because their iron needs are increased during rapid growth and weaning diets in developing countries are commonly low in iron.[7] Primary prevention of iron-deficiency in infant and preschool children should be achieved through diet.[3]

The aim of this study is to determine the prevalence and some determinants of anemia among preschool children in Alexandria.

MATERIAL AND METHODS

A cross-sectional study design was used where the study population is composed of all children aged 2-5 years [984 preschoolers], from three nurseries located at 3 localities [Anfushy, Smouha and Boulkly] representing different socio-economic levels in Alexandria.

Sampling:

The estimated minimum required sample size using Epi Info software is 280 children. A systematic random sample was selected from among the three nurseries. Mother or father were interviewed and their concent was obtained for stool analysis and blood sampling of their kids. The purpose of stool analysis was to exclude parasitic infection. All parents responded to questionnaire and anthropometric measurements were carried out for all children. However, those who

responded to blood sampling of their children and with negative stool analysis constituted 214 subjects [76.4%] with no significant difference between respondents and non respondents in sociodemographic characteristics.

Nutritional assessment:

Two parameters were used to evaluate the nutritional status of children; anthropometric measurements [weight & height] and biochemical analysis [hemoglobin concentration and blood lead]. For measurement of height, the subject stood erect, without shoes, with weight equally distributed on both feet and heels together and touching the vertical board and looking straight a head. Height is recorded to the nearest 0.1 cm. Body weight is measured on a leveled platform scale with movable weights. The subject, in minimum clothing and without shoes, stands with weight evently distributed on both feet: weight is recorded to the nearest 100 gm. Measurements of weight and height are interpreted by comparison to tables derived from a reference population.[8]

The determination of lead was carried out as described by AOAC 1994, using atomic absorption spectrophotometer 3300 Perkin Elmer.[9]

Because of its low cost, easy and rapid application, the test most commonly used to screen for anemia is hemoglobin [Hb] level. This measure reflects the amount of functional iron in the body. The concentration of the iron-containing protein Hb in circulating red blood cells is the most direct and sensitive measure.[3] The WHO criterion for iron deficiency anemia [hemoglobin level <11 g/dl] was used to diagnose anemic children.[10]

Data analysis:

Data were tabulated and analyzed using Epi Info version 6.04 and SPSS version 9 software packages. A p-value of 0.05 was used as cut off for statistical significance. Data on blood lead were log transformed due to their positive skewness. Student's t-test, simple correlation coefficient and odds ratio with 95% confidence interval were used for bivariate analyses while stepwise logistic regression was used for multivariate analysis of anemia and the studied independent variables.[11]