

Normal Blood Cells Reference Intervals of Healthy Adults at the Gaza Strip—Palestine

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Hematological parameters are affected by different factors that include age, sex, smoking, ethnicity, and environmental altitude. It has been justified that each population must establish its own normal reference intervals to be used in clinical assessments and interpretations. Hematological reference intervals for adults from the Gaza Strip—Palestine have never been addressed. Therefore, this study was designed and aimed at the establishment of normal blood cells reference intervals for healthy adults at the Gaza Strip—Palestine. This study involved 89,491 apparently healthy individuals (*from both sexes and from the different governorates of the Gaza Strip*) who were referred to the Thalassaemia Central Laboratory during the period from September 2000 until February 2008. Complete blood counts were performed. Subjects were categorized into subgroups according to gender, smoking habit, and

age (15–18, 19–45, and >45 years old). For each subgroup, descriptive and comparative statistical analysis was performed for hematological parameters. The results showed substantial differences between males and females, between smokers and nonsmokers, and between the different age groups. Moreover, reference intervals derived from our population are markedly shifted downward as compared with Western European and American populations. It was concluded that separate and region-specific reference intervals based on gender, smoking, and age for the Palestinian population at the Gaza Strip should be generalized for clinical laboratories and clinical practitioners, which could help in interpreting laboratory hematological tests more specifically, and potentially develop the quality of medical care provided to patients. *J. Clin. Lab. Anal.* 22:353–361, 2008. © 2008 Wiley-Liss, Inc.

Key words: reference intervals; blood cells; percentiles; hematological parameters; smoking; age-related changes; sex-related changes

INTRODUCTION

Establishing normal reference intervals for the hematological parameters is an important step in interpreting the laboratory investigations in health and disease cases. Even for healthy populations, the values of the hematological parameters are affected by different factors that include age, sex, ethnicity, and environmental altitude (1–8). Different studies have been performed and significant differences have been reported in different populations. Consequently, different populations and ethnic groups had reported their own normal reference intervals for the hematological parameters at least for the different age and gender subgroups (9–13). More detailed investigations reported also significant differences in these parameters with

respect to other confounding factors such as smoking and nutritional status (14,15). For these reasons, it has been justified that each population must establish its own normal reference interval values, not only for hematological parameters but also for all laboratory tests, to be used in clinical assessments and interpretations (2,16). Hematological reference intervals for adults from the Gaza Strip—Palestine have never been established. The values that are currently used in the

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