Receiver Operating Characteristic Curve of Total Serum IgE in Allergic Patients

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ABSTRACT

Background and objective: Validity of continuous variable test like total serum IgE is performed by constructing Receiver Operating Characteristic (ROC) curve. ROC curve is a technique for visualizing, organizing and selecting classifiers based on their performance. The study aims to determine the performance and validity of total serum IgE in various allergic diseases, age groups and gender. To select the optimal cut off value that has the best discriminative capability. To assess the sensitivity, specificity, predictive value and likelihood ratio of the selected cut-off points.

Materials and method: A diagnostic Receiver Operator Characteristic ROC curve study was conducted at Allergy Clinic, Al-Jamhouri Teaching Hospital in Mosul, Iraq on 751 individuals (561 patients with various allergic disorders and 190 healthy non-allergic subjects) ranged in age from 10 to 59 years. Classification of study samples into allergic or healthy groups was done by a committee panel of two qualified and expert allergiologist. A blood sample was taken for estimating total serum IgE by ELISA.

Results: The constructed ROC curve of overall sample showed that total serum IgE has moderate accuracy in allergic diseases and the AUC ± SE was 0.730±0.022 with 95% confidence interval (0.686-0.773). Urticaria ROC curve had the maximum AUC (0.742±0.030) and asthma had the minimum AUC (0.720±0.027). The maximum AUC was detected in the age group 10-19 years and the least one was in age 50-59 years. No difference was found in the estimated AUC in both gender. The optimal cut-off point of total serum IgE was 96 IU/ml in the overall allergic patients and varies between 95 IU/ml (in urticaria) and 115 IU/ml (in rhinitis). Assessment of selected overall cutoff point of total serum IgE reveals the following: sensitivity (79.3%), specificity (61.0%), validity (74.7%), PPV (50.0%), NPV (85.7%), LH+ (2.03), LH-(0.34).

Conclusion: Total serum IgE has moderate accuracy in diagnosis of various allergic diseases. Its accuracy is much better in younger patients in comparison to elderly. A cut off point of total serum IgE(100±5 IU/ml) was the best classifier. Total IgE is a useful screening rather than a confirmatory test.

Key word: Total IgE, Allergy, ROC curve

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