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CLINICAL AND ENVIRONMENTAL FACTORS AFFECTING GOITRE IN SRI LANKA

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Goitre, an enlargement of the thyroid gland, is one of the main health problems in tropical countries. It is generally believed that the development of goitre is directly related to iodine deficiency; however, complex interactions between clinical, environmental and genetic factors also influence the incidence of goitre. This study aims to identify a plausible relationship between clinical and environmental factors affecting the occurrence of goitre in Anuradhapura, Colombo, Kurunegala, Nuwara-Eliya and Ratnapura districts covering all climatic zones of Sri Lanka. A hospital-based preliminary study was conducted from 2012 to 2014 with 994 goitre patients attending to receive treatments in five Base Hospitals in Sri Lanka. A structured questionnaire survey was conducted at each hospital to record clinical examinations and investigation findings of patients. Moreover, 562 water samples for iodine and 147 samples for selenium were collected from the nearest water sources, which they used for drinking and cooking. The mean age of patients in the study was 43 years, and the majority (98%) of the population was females, with 36% having a family history of goitre. The goitre grades 3 and 4 were more prominent among the six goitre grades in the population. There was an increasing trend of a grade of goitre with the increasing age in all three climatic zones. It is noteworthy that patients in the wet zone had higher grades of goitre even at younger ages compared to two other climatic zones. Hierarchical cluster analysis was performed based on environmental factors consisting of iodine and selenium concentrations and clinical factors including thyroxine (T_4), triiodothyronine (T_3) and Thyroid-stimulating hormone (TSH). The study classified patients into seven clusters, with a dominant feature in each cluster. Patients from Nuwara-Eliya formed the most prominent cluster where a significant negative correlation is visible between iodine and selenium with T4 level. These clusters reveal the classification of patients other than district or zone-wise, which breaks the traditional methods to diagnose endemic goitre. These results can be used as baseline data for better planning to avoid and treat goitres.

Keywords: Clinical factors, Environmental factors, Goitre, Hierarchical cluster analysis