

**STUDY OF THE GOITRE DISTRIBUTION OF NUWARA-ELIYA DISTRICT BY MEANS OF LEVELS OF IODINE AND SELENIUM CONTENT IN DRINKING WATER SOURCES**

**G.Y.A.N.Sarathchandra\*<sup>1</sup>, G.W.A.R.Fernando\*<sup>2</sup> and A. U.Rajapaksha\*<sup>3</sup>**

*<sup>1</sup>Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka*

*<sup>2</sup>Department of Physics, The Open University of Sri Lanka*

*<sup>3</sup>Department of Basic Sciences, Faculty of Health Sciences, The Open University of Sri Lanka*

Iodine deficiency disorders (IDD) are a main global health problem all over the world and endemic goitre is the most common due to the lack of iodine in the diet. It is found that drinking water is an important source of iodine. Even though Sri Lanka has a maritime climate endemic goitre has been reported in Sri Lanka for the past 50 years. In recent years, it has been suggested that selenium may also be an important factor in the beginning of IDD. This research study initiates to find out the goitre distribution of the Nuwara-Eliya district which is the highest elevated areas in the country and assess the possible causes with special reference to the relationship of levels of iodine and selenium content in drinking water sources. The dissolved iodine in the water resources was analyzed by Ion Selective Electrode method and selenium determinations were carried out using Inductively Coupled Plasma Optical Emission Spectrometry. Spring water, the major drinking water source in the district, clearly showed that the largest part of the areas lie in the lowest range of iodine concentration, between 0-10  $\mu\text{g L}^{-1}$ . The selenium concentration are low in natural springs, however, it is also shows higher values upto 125.0  $\mu\text{g L}^{-1}$  in the tea plantations and floriculture farming areas. The highest numbers of the goiter patients were recorded in Nuwara Eliya District Secretariat (67%) and Walapane District Secretariat (24%). Females (95.5%) are at greater risk of goitre than males. Most of the patients belong to the age group 40-58 years. The study revealed that selenium deficiency is the main controlling factor in IDD but it could contribute to the beginning of goitre along with iodine deficiency and other factors such as poor nutritional status. Even though iodine and selenium are considered as an essential constituent for the development of goitre, iodine and selenium cannot alone considered as the main factor for goitre problem reported in Nuwara Eliya district. High selenium found in water could not enter to the food chain of the people living in such areas, perhaps due to their different dietary habits.

**Keywords:** Endemic goitre, Iodine deficiency disorders (IDD), Selenium