

INVESTIGATION OF MAGNESIUM DEFICIENCY AMONG SEVERAL SOCIAL SEGMENTS IN SRI LANKA

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Abstract:-A community survey was carried out to investigate food combinations and their portion sizes of several 'active' social segments in Sri Lanka, which represent rapid changes of lifestyles due to urbanization and modernization. Those identified food combinations were analyzed for their proximate compositions of Magnesium using the Atomic Absorption Spectroscopy method. Obtained results were compared with the WHO Reference Dietary Intake (RDI) for Magnesium (400 mg / day).

Among the social segments, School Children aging between 14-18 years (320 mg / day) and Managerial level employees (302 mg / day) elicited significantly low levels of daily Magnesium intakes, which sounds an alarm of severe health disorders in future.

Index terms— Magnesium, RDI, Urbanization

I. INTRODUCTION

Conversion of tradition life patterns in to busy lifestyles has reduced plant food intakes in many social segments. Plant foods are rich in Magnesium (Mg) which is an extremely important mineral to human body.

Magnesium is considered the "antistress" mineral. It is a natural tranquilizer, as it functions to relax skeletal muscles as well as the smooth muscles of blood vessels and the gastrointestinal tract. While calcium stimulates muscle contraction, magnesium relaxes them. Because of its influence on the heart, magnesium is considered important in preventing coronary heart attacks [1].

Jung states that to function optimally, Magnesium must be balanced in the body with calcium, phosphorus, potassium, and sodium chloride. For

example, with low Magnesium, more calcium flows into the vascular muscle cells, which contracts them- leading to tighter vessels and higher blood pressure. Adequate magnesium levels prevent this [2].

This study includes a community survey and a laboratory experimentation to identify Magnesium levels in commonly consumed foods among Sri Lankans, a community which now elicit rapid lifestyle changes due to urbanization and modernization.

II. METHODOLOGY

The study included randomly selected 4000 people covering all provinces in Sri Lanka. A questionnaire was given to assess the variety and amount of their daily nutrient intake. The sample population contained.

- Office workers = 800
- Lecturers / Teachers = 400
- Private sector Executives/Managers = 400
- Labourers = 800
- House wives = 800
- Athletes = 200
- School children (Age 14-18) = 600

(24 – 54
years)

The total number of 4000 volunteers selected were categorized according to the environment their living as follows to get a better understanding about their dietary patterns. Among the districts, the sample sizes were determined according to their population ratios. In the entire population (4000) used in the survey there were 21.4 % lacto-vegetarians, 6.2 % lacto-ovo-vegetarians, 11.2 % Piscaterians and only 1.1 % of Vegans. Among the rest of the 60.1 %, all preferred to eat chicken. There were only 14.3 % pork and 9.6 % Mutton consumers among them. Beef consuming

proportion was 19.8 %, where as lamb and turkey consumers were less than 0.5 %.

Test portions are dried and then ashed at 450°C under a gradual increase (about 50°C / hr) in temperature, 6N HCl (1+1) was added and the solution was evaporated to dryness. The residue was dissolved in 0.1 N HNO₃ and the analytes were determined by flame and graphite procedures.

The two tailed T-test in MS Office Excel 2007 was used to compare significant deviations of obtained results from WHO recommendations for RDI of Magnesium.

III. RESULTS AND DISCUSSION

A significant ($p < 0.05$) deficiency of Magnesium intake was observed amongst managerial level employees and in school children, who often consumes processed foods and fast foods (Figure 1). All other segments were fulfilling their Mg amounts adequately or in exceeding levels, where deviations from the RDI were not significant ($p > 0.05$).

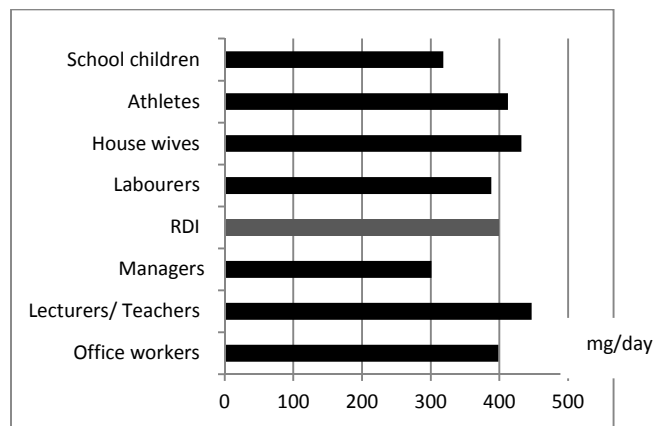


Figure 1: Daily intake of Magnesium by

different segments in the community. Decreases in magnesium intake have been more prevalent in our diet with additions of supplemental vitamin D and calcium, dietary phosphorus, and refined or processed carbohydrate foods. Drinking soft water decreases Magnesium intake, while alcohol cause Magnesium loss, as do caffeine and sugar [3]. Decreased blood and tissue levels of Magnesium have been shown to be related to high blood pressure [4], kidney stones, heart disease and, particularly heart

attacks due to coronary artery spasm since Magnesium help to relax and dilate coronary arteries. Studies done by Haaz and colleagues further indicate that, a decreased concentration of Magnesium is found in the heart and blood of heart attack victims.

Therefore it is of utmost importance to consume at least the WHO recommended daily allowance of Mg, to minimize the risk of several chronic diseases.

IV. CONCLUSIONS

Change of lifestyles which have led to consume more fast food and unawareness of how to balance nutrients in a diet, have resulted in lower intakes of Magnesium by several social segments in Sri Lanka, which may influence higher rates of several non-communicable diseases in the society if continued in the same fashion.

This could be overcome by incorporation of higher quantities of vegetables and fresh fruit sources to regular diets that are abundant in the market for cheaper prices in this tropical country.

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