

Study on the Prevalence of Thyroid Diseases in Ernakulam City and Cherthala Town of Kerala State, India

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Abstract- Two study groups were surveyed for the study of the prevalence of thyroid diseases. One study group is from Ernakulam city and the other from Cherthala town, both situated in Kerala, India. Families of five hundred college students from each of the above said regions were selected as the study group which in effect forms a random sample from the area. A total of 1000 subjects (adults) were surveyed. Questionnaires were prepared and distributed to conduct the survey. 53% and 37% of the total surveyed subjects of Ernakulam and Cherthala are affected with thyroid disease respectively. The incidence of thyroid diseases is more in Ernakulam city which represents an urban metro area with people following a metro life style. People following non-vegetarian food habit are most heavily affected. Health problems such as high cholesterol level, obesity, diabetics, cardiac problems are also found in the diseased subjects, the highest being diabetics.

Index Terms- thyroxin, thyroid disease, ernakulam city, cherthala town.

I. INTRODUCTION

Thyroid disease is being increasingly diagnosed with greater awareness and is one of the chronic non-communicable disease affecting women more, though male population is not spared of the ailment. Thyroid is a butterfly-shaped gland in the neck region, just above collarbone. It is one of the endocrine glands, which make hormones. The thyroid hormones, thyroxin (T_4) and triiodothyronine (T_3) are tyrosine-based hormones produced by the thyroid gland primarily responsible for regulation of metabolism. An important component in the synthesis of thyroid hormones is iodine. The major form of thyroid hormone in the blood is thyroxin (T_4). The thyroid also produces the hormone calcitonin, which plays a role in calcium homeostasis. Thyroxin increases cardiac output, increases heart rate, increases basal metabolic rate, increases ventilation rate, potentiates brain development, potentiates the effects of catecholamines (i.e. increases sympathetic activity), thickens endometrium in females. These hormones also regulate protein, fat, and carbohydrate metabolism, affecting how human cells use energetic compounds. They also stimulate vitamin metabolism. Numerous physiological and pathological stimuli influence thyroid hormone synthesis. Both excess (hyperthyroidism) and deficiency (hypothyroidism) of thyroxine can cause disorders. Hyperthyroidism is the clinical syndrome

caused by an excess of circulating free thyroxin, free triiodothyronine, or both. It is a common disorder that affects approximately 2% of women and 0.2% of men. The symptoms of Hyperthyroidism are fast heart rate, nervousness, increased perspiration, muscle weakness, trembling hands, weight loss, hair loss, skin changes, increased frequency of bowel movements, decreased menstrual flow and less frequent menstrual flow, goiter, eyes that seem to be popping out of their sockets. Hypothyroidism is the case where there is a deficiency of thyroxin, triiodothyronine, or both. The symptoms of hypothyroidism are Feeling slow or tired, Feeling cold, Drowsy, Slow heart rate, Poor memory, Difficulty concentrating, Muscle cramps, Weight gain, Husky voice, Thinning hair, Dry and coarse skin, Feeling depressed, Heavy menstrual flow, Milky discharge from the breasts, Infertility, Goiter. Clinical depression can sometimes be caused by hypothyroidism. Some research has shown that T_3 is found in the junctions of synapses, and regulates the amounts and activity of serotonin, norepinephrine, and Gamma-aminobutyric acid (GABA) in the brain. Thyroiditis is an inflammation of the thyroid gland and the most common cause of hypothyroidism. About 20 million Americans have some form of thyroid disease and most of them are women. It is estimated that there are at least forty million individuals with thyroid disease in India. Most of them are women, and most hypothyroidism occurs after the birth of a baby, called postpartum hypothyroidism. Thyroid diseases are most common among women and if not treated in time it can lead to severe health problems. Hashimoto's thyroiditis affects about 5% of the adult population, increasing particularly in women as they age. Another form of thyroiditis affects women of childbearing age. Postpartum thyroiditis occurs in 5%-9% of women soon after giving birth and is usually a temporary condition. While thyroid diseases are increasing, there is a notion that it is prevalent in certain areas than others. Objective of this work is to study the prevalence of thyroid diseases in two different areas in Kerala state. To attain this objective a survey is done by taking a random sample from the areas under study. The outcome of the result may give an idea about the prevalence of thyroid diseases and this data may be useful for the further study of thyroid diseases whose reasons can be the particular food habits of the area, type of foods that are distributed in that area, or the presence of some harmful compounds in the water that is being distributed in that area or the type of salt that is distributed in that area etc. The prevalence and pattern of thyroid disorders depends on sex, age, ethnic and geographical factors and especially on iodine intake [1]. A high iodine intake is associated

with lower prevalence of goiter and higher prevalence of hypothyroidism. Low intake is associated with a higher prevalence of hyperthyroidism [2]. Hypothyroidism is more common in older women and 10 times more common in women than men [2]. The prevalence of hyperthyroidism is also reported as more common in women than men [4]. The profile of thyroid disorders encountered in pediatric and adolescent age groups in India is similar to that seen in most parts of the world. Of 800 children referred for thyroid problems, 79% had hypothyroidism, 19% had euthyroid goiters and 2% had hyperthyroidism. Hypothyroidism was due to thyroid dysgenesis in 75%, thyroiditis in nearly 5% and dysmorphogenesis in 20%. The incidence of congenital hypothyroidism in screening 40,000 newborns is about 1 in 2,640, which is much higher than the worldwide average of 1 in 3,800. Of the 200 schools children surveyed for goiter prevalence, 8% in high socio-economic groups and about 21% in the low income group, had goiters. Female predominance was marked [5]. The results from the study of fifteen districts from ten states of India in 2004 suggested a significant decline in the prevalence of goitre in most parts of the country [6]. A study by British researchers found that people with high levels of the chemical perfluorooctanoic acid (PFOA) in their blood have higher rates of thyroid diseases with conditions which affects the body's metabolism. PFOA is a common chemical, used in industrial and consumer products including non-stick cooking pans, stain-proof carpet coatings and waterproofing for fabrics. British researchers studied 3966 American adults aged 20 and above whose blood serum was sampled between 1999 and 2006 for PFOA. Those with the highest PFOA concentrations (above 5.7 nanograms per milliliter) were more than twice as likely to report current thyroid disease as individuals with the lowest levels (below 4.0ng/ml) [7].

II. MATERIALS AND METHODS

A city and a town in Kerala state, Ernakulam and Cherthala respectively, was selected to conduct the survey. Cherthala is a town located in the district of Alappuzha, in the state of Kerala, India. It is located 30 km south of the city of Kochi and 22 km north of Alappuzha town. Ernakulam is the western part of the mainland of Kochi city in Kerala, India. Ernakulam is the commercial capital of the state of Kerala. Five hundred students from two colleges, NSS College, Cherthala and St. Albert's College, Ernakulam, located in the above said regions of Kerala were selected for the survey. The selected students in effect constitute a random sample from the area. Questionnaires were prepared and distributed among five hundred students randomly selected from each college. The questionnaires asked for the presence, and hence the details of a thyroid patient in the students' families.

III. OBSERVATIONS AND RESULTS

53% and 37% of the total surveyed subjects of Ernakulam city and Cherthala town are affected with thyroid disease respectively (Fig.1). Of the 500 subjects surveyed in Ernakulam area, 53% have thyroid disease. Among them 15.09% follows a vegetarian food habit, 54.71% are non-vegetarians and 30.18% prefer both type of food. 7.54% of them have cholesterol level higher than

normal, 28.30% are diabetic, 13.20% are obese and 7.54% are affected with cardiac problems. 61.53% of the affected subjects are prescribed with life long medication. The rest, 38.46% subjects are following a short term medication. 19.23% of the diseased persons are following ayurvedic medicine, 46.15% homeopathic medicine and 34.61% allopathic medicine. 37% of the subjects surveyed in Cherthala region are affected with thyroid disease. Among them 27.02% follows a vegetarian food habit, 51.35% are non-vegetarians and 21.62% prefer both type of food. 10.81% of them have cholesterol level higher than normal, 40.54% are diabetic, 16.21% are obese and 8.10% are affected with cardiac problems. 76.66% of the affected subjects are prescribed with life long medication. The rest, 23.33% subjects are following a short term medication. 27.02% of the diseased persons are following ayurvedic medicine, 37.83% homeopathic medicine and 35.15% allopathic medicine.

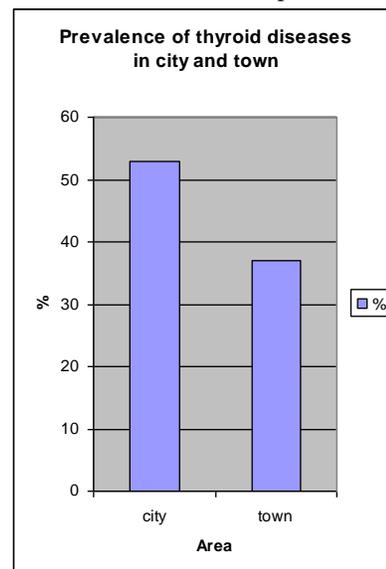


Fig. 1 Bar diagram showing the prevalence of thyroid diseases in Ernakulam city and Cherthala town

IV. DISCUSSION

Survey shows that Ernakulam city has a high incidence of thyroid diseases. More than half, i.e. 53% of the total surveyed subjects were affected with thyroid disease. Only 37% of the study group of Cherthala area shows thyroid disease. This difference in thyroid disease incidence may be due to the difference in food and life style of the people of Ernakulam city, which is the part of an urban metro city. There may be variety of reasons such as the particular type of food being distributed in the various shops of this area, harmful compounds that may be leaking into the water from the various factories and industries of the area, toxic compounds that find their way into human body through contact with fabrics, paints, non stick pans., etc. More than half of the subjects with thyroid disease in both the study group are following non-vegetarian food habit. Most of them are diabetics, 28.30% of Ernakulam city and 40.54% of Cherthala town. The second most ill health shown by the affected persons in both area is obesity, the first being diabetics. 7.54% of the Ernakulam city and 10.81% of the Cherthala town shows high cholesterol level. 8% of the thyroid diseased persons show cardiac problems. This is because the peculiar feature of thyroid

hormones which have a variety of functions whose elevation can cause various health problems. Among the diseased persons only few are following life long medications, 38.46% in Ernakulam and 23.33% in Cherthala. Rest of the subjects is following short term medication. In both the study groups, most people are following homeopathic medicine, the next being allopathy. Few subjects are following ayurvedic medicine.

V. CONCLUSION

The incidence of thyroid diseases is more in Ernakulam city which represents an urban metro area. People following non-vegetarian food habit are most heavily affected. Health problems such as high cholesterol level, obesity, diabetics, cardiac problems are also found in the diseased subjects, the highest being diabetics.

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