Paper ID: 220

Knowledge On Usage Of Thyroxin Tablet Among Primary Hypothyroidism Patients Attending Endocrinology Clinic At Teaching Hospital Jaffna

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Abstract: Hypothyroidism is a common condition in Sri Lanka as it is world-wide. Most of the people were getting treatment for hypothyroidism in Jaffna. By having good knowledge on usage of thyroxin medicine, can be improving the quality of life. The aim of the study was to evaluate knowledge on usage of thyroxin tablet and assess relationship between sociodemographic factors and knowledge among primary hypothyroidism patients. A descriptive cross-sectional study was conducted in 2019, used interviewer administered questionnaire, include whole population who had primary hypothyroidism and SPSS 25 and chi square test were performed to found out the relationship. Among the participants' majority were females (88.5%), in between age of eighteen to thirty and mean age was 37.5 years. Most of the participants (97.7%) knew thyroxin should be taken as once daily, 94.1% knew that thyroxin should take in early morning at empty stomach, 62% knew thyroxin should store in brown colour container. Only 19% knew that thyroxin can cause side effects, 40% was knew that consult the doctor when notice any side effects following ingestion of thyroxin however only 19% was knew that should consult the doctor if missed tablet more than 3 days. Nearly two third of the participants (64.9%) had poor knowledge. Factors were assessed and no relationship identified. To improve the patients' knowledge, increase the availability of articles in newspapers, internet and books in their own mother tongue and small session can be carried out during clinics.

Keywords: knowledge, hypothyroidism, Teaching Hospital Jaffna

Introduction

Hypothyroidism is defined as a condition in which the production of the thyroid hormones thyroxin (T4) and triiodothyronine (T3) by the thyroid gland is inadequate to meet peripheral tissue demand. Thyroid failure caused by a disease of the thyroid gland is termed primary hypothyroidism. Primary hypothyroidism is by far the most common cause of hypothyroidism, and occurs as a result of Hashimoto‟s thyroiditis, thyroidectomy and radiotherapy to the neck, radioiodine thyroid ablation or medications.

Decreased levels of circulating free thyroxin and free triiodothyronine (fT4 and fT3) stimulate the production of thyroid stimulating hormone (TSH) in the pituitary gland to restore sufficient thyroid hormone production. An elevated serum TSH level is the main and most sensitive laboratory abnormality to occur in primary hypothyroidism, followed by reductions in serum levels of fT4 and fT3. Synthetic levothyroxine is the treatment of choice for primary hypothyroidism (Mandel, Brent, & Larsen, 2016).

Primary hypothyroidism results from under secretion of thyroid hormone and secondary hypothyroidism is caused by lack of TSH

production from the pituitary. The most common cause for hypothyroidism in Sri Lanka is autoimmune thyroid disease (Hashimoto‟s thyroiditis). Clinical suspicion of hypothyroidism, Strong family history of hypothyroidism, Newborns of mothers with thyroid diseases, Past history of neck irradiation, Radioactive iodine or thyroid surgery, patients on drugs such as lithium or amiodarone, children with Down syndrome, Patients with other autoimmune diseases these are the indication for screening hypothyroidism (Somasundaram, Wijeyaratne, Fernando, & Siribaddana, 2012). Thyroxin is stable in dry air, but unstable in the presence of light, heat and humidity. In some cases overseas, thyroxin tablets have been unstable even at room temperature, and storage temperatures of 8°C to 15°C were necessary to maintain potency. Therefore very essential that thyroxin tablets should be kept in their original container and stored out of sunlight in a cool dry place (Roberts, Pharmacist, Hospital, & Park, 2004).

Thyroxin is variably absorbed from the gut following oral administration. It has a bioavailability of 40–80%. Absorption may decrease with age. The extent of thyroxin absorption is increased in the fasting state and is influenced by the content of the gastrointestinal tract. Some substances bind the thyroxin, making it unavailable for diffusion across the gut wall. Concurrent administration with iron salts, antacids, calcium carbonate (including milk), sucralfate, cholestyramine and soy-based formulas may therefore decrease absorption of thyroxin (Roberts et al., 2004). For patients, particularly children, who cannot swallow tablets, the tablets may be crushed in 10–20 mL of water, breast milk or non-soybean formula. The resulting mixture should be used immediately and any remainder discarded. Breast milk contains only 20–30% of the calcium concentration of cow's milk, making the likelihood of decreased thyroxin bioavailability less likely. Nonetheless, if breast milk is used to deliver the thyroxin, it should be used consistently, in order to minimize any variation in absorption (Roberts et al., 2004).

Methodology

It was a hospital based descriptive cross-sectional study conducted in Endocrinology clinic at Teaching Hospital Jaffna among the primary hypothyroidism patients from August 2018 to July 2019 with sample size of 380. Researcher visited on that clinic days and take whole population for the data collection. Total 305 participants data was collected in 25 clinics by used interviewer administered questionnaire. The questionnaire was designed as section A and B. Section A included socio demographic factors of study participants include age, gender, civil status, educational level, employment, working hours and distance. Section B contain questions to assess the knowledge of patient regarding name of the medicine, dosage, frequency, time, storage, side effects, interaction, overdose and consultation of medicine usage. Each correct answer carried one marks and total maximum obtained score was fourteen marks then it converted into percentage. The scoring of knowledge was categorized into two categories which were poor (less than 75%) and good (more than 75%). The collected data was analysed by SPSS 25 (statistical Package for Social Sciences). Data was calculated as mean, standard deviation, percentage, average and the result was presented as table and diagram. Chi square statistical test was performed to find out relationship.

Results and discussion

In this study mean age of participants was 37.45 (SD=14.59). Age range of the participants was 9 to 68 years old. More than half of them (64.3%) were greater than 30 years old. Most of the participants (88.5%) were female. Most of the participants is Married (70.8%), 39.7% were studied up to

O/L and 0.7% were not get any education. Most of the participants (84.3%) were not working. Among the Employees, 81.3% were working for 6-10 hours. Majority (90.5%) of the participants were coming to clinic with in 25km of distance. A study done in India by Sethi et al., revealed that mean age of respondents was 43.0 (±13.6) years and 72.4% were women. Most participants were undergraduates (44.2%) and graduates (39.6%) (Sethi et al., 2016). In this present study, mean age was less, female participants were high and only 3.6% were graduates.

Among them 94.1% knew the name of the drug and correctly name it. 90.8% knew their dosage of the drug. Only 43.5% of the participants were using 75-100 µg, 35.9% was using 25-50 µg. A study was done in UK by Dew et al in 2017 revealed that only 7.4% were using 25-50 µg at the same time 33.3% were using 75-100 µg (Dew et al., 2017). In this present study both frequencies was increased because of high number of participants and geographical variations. Thyroxine is the treatment of choice for hypothyroidism. It has a seven day half-life, allowing daily dosing (Chakera et al., 2011). Most of the participants (97.7%) knew thyroxin should be taken as once daily. Hypothyroid patients are advised to take thyroxine on an empty stomach half an hour before breakfast to prevent impairment of absorption by food (Chakera et al., 2011). Most of the participants (94.1%) knew that thyroxin should take in early morning at empty stomach and 1.0% told that it can be taken after dinner. A small nonrandomized study involving eleven hypothyroid patients on a stable dose of morning thyroxine found a decrease in mean TSH and an increase in free thyroid hormone levels when the timing of levothyroxine dosage was changed to bedtime (Chakera et al., 2011).

Most of the participants (62.0%) knew that thyroxin should store in brown color container and 14.8% were told in brown color blister pack. Nearly 17.4% were told that it should be store in plastic bottle and only 5.2% were told in paper covering. It may be due to insufficient knowledge among the participants. It can be corrected by giving proper storage methods by pharmacists when they give to the thyroxin medicine. Most of the participants (83.0%) were known that thyroxin should store away from the light. More than half of the participants (53.8%) were known thyroxin dosage may vary with age, weight and other medical condition. A randomized controlled trial has shown that, in patients with no significant comorbidities, initiation of levothyroxine at a full dose based on body weight (1.6 µg/kg/day) is safe and effective (Chakera et al., 2011). It is important to know about thyroxin dosage vary with medical condition because people have more attention to take care in their health in special situations. But in this present study nearly 46.2% were giving wrong answer. Most of the participants (79.7%) knew that thyroxin should not be taken with any other drugs. When the patients had good knowledge about drug interaction only they can get good compliance.

Only 19.0% were known that thyroxin can cause side effects, but Most of the participants (74.8%) told thyroxin not cause any side effects. Health education and posters can be provide in clinic setup can correct the knowledge about side effects. Most of the participants (83.6%) were known that discontinuation must done after consulting with doctor. However some participants told that discontinuation can be done without consulting doctor once the symptoms were settled. Majority (73.1%) were known that it is important to tell the pharmacist/ doctor regarding thyroxin usage when taking medicine for other medical conditions.

Only 40.0% was knew that consult the doctor when notice any side effects following ingestion of thyroxin, at the same time 48.9% were told that it is not important to consult the doctor. Nearly 46.2% were told consult the doctor if take overdose of thyroxin. Only 19.0% was knew that should consult the doctor if missed tablet more than 3 days and more than half of the participants

(59.0%) did not knew that. Thyroxin level should be maintained in normal level, it is important to know about missed dose to improve compliance of the patients. It can be corrected by providing health education.

Most of the participants (64.9%) have poor knowledge and only (35.1%) have good knowledge. Similar study done in India by Sethi et al. on 2016 concluded that most participants (66.6%) had a low level of knowledge (Sethi et al., 2016). In this present study more than half of the participants follow clinic for 1-5 years (52.1%). A study was done in UK in 2017 by Dew et al, revealed that only 22.3% were following clinic less than 5 years (Dew et al., 2017). This variation may be due to the geographical variation. Most of the participants (99.3%) took thyroxin at empty stomach. Majority (85.9%) took thyroxin 30 minutes before breakfast. Similar results was observed in a study done in India by Sethi et al, in 2016 concluded that 92.6% were taking thyroxin 30 minutes before breakfast on empty stomach (Sethi et al., 2016).

Table 1: knowledge on thyroxin medicine usage Frequency

Knowledge on thyroxin medicine usage	Frequency	Percentage (%)
Poor knowledge	198	64.9
Good knowledge	107	35.1

Conclusion

The results of the study suggest that interventions should be carried out to increase level of knowledge among primary hypothyroidism patients in endocrinology clinic at THJ. Based on the findings small sessions should be carried out by health professionals, increase the availability of articles in newspapers, internet and books in their own mother tongue. This study may serve as base for future studies. There is a need to be conducting further research by using lager population, which would be more representative of primary hypothyroidism patients.

References

Carr, D., McLeod, D.T., Parry, G. and Thornes, H.M., 1988. Fine adjustment of thyroxine replacement dosage: comparison of the thyrotrophin releasing hormone test using a sensitive thyrotrophin assay with measurement of free thyroid hormones and clinical assessment. Clinical endocrinology, 28(3), pp.325-333.

Chakera, A.J., Pearce, S.H. and Vaidya, B., 2012. Treatment for primary hypothyroidism: current approaches and future possibilities. Drug design, development and therapy, 6, p.1.

Chao, M., Jiawei, X., Xia, H., Guoming, W., Yangang, W., Xufu, W. and Shuyao, Z., 2009. Thyroxine alone or thyroxine plus triiodothyronine replacement therapy for hypothyroidism. Nuclear Medicine Communications, 30(8), pp.586-593.

Davis, F.B., LaMantia, R.S., Spaulding, S.W., Wehmann, R.E. and Davis, P.J., 1984. Estimation of a physiologic replacement dose of levothyroxine in elderly patients with hypothyroidism. Archives of internal medicine, 144(9), pp.1752-1754.

Dew, R., King, K., Okosieme, O.E., Pearce, S., Donovan, G., Taylor, P., Leese, G., Hickey, J., Razvi, S., Dayan, C. and Wilkes, S., 2017. Patients" attitudes and perceptions towards treatment of hypothyroidism in general practice: an in-depth qualitative interview study. BJGP Open, 1(2), pp.BJGP-2017.

Fang, L. and Tan, T., 2005. Development of hypothyroidism therapy with thyroid hormone. Sheng wu yi xue gong cheng xue za zhi= Journal of biomedical engineering= Shengwu yixue gongchengxue zazhi, 22(2), pp.396-399.

Fish, L.H., Schwartz, H.L., Cavanaugh, J., Steffes, M.W., Bantle, J.P. and Oppenheimer, J.H., 1987. Replacement dose, metabolism, and bioavailability of levothyroxine in the treatment of hypothyroidism. New England Journal of Medicine, 316(13), pp.764-770.

Goel, A., Shivaprasad, C., Kolly, A., Pulikkal, A.A., Boppana, R. and Dwarakanath, C.S., 2017. Frequent Occurrence of Faulty Practices, Misconceptions and Lack of Knowledge among Hypothyroid Patients. Journal of clinical and diagnostic research: JCDR, 11(7), p.OC15.

HENNESSEY, J.V., EVAUL, J.E., TSENG, Y.C., BURMAN, K.D. and WARTOFSKY, L., 1986. L-thyroxine dosage: a reevaluation of therapy with contemporary preparations. Annals of internal medicine, 105(1), pp.11-15.

Hueston, W.J., 2001. Treatment of hypothyroidism. American family physician, 64(10), pp.1717-1724.

Kumar, P., Khandelwal, D., Mittal, S., Dutta, D., Kalra, S., Katiyar, P. and Aggarwal, V., 2017. Knowledge, awareness, practices and adherence to treatment of patients with primary hypothyroidism in Delhi. Indian journal of endocrinology and metabolism, 21(3), p.429.

Mandel, S.J., Brent, G.A. and Larsen, P.R., 1993. Levothyroxine therapy in patients with thyroid disease. Annals of Internal Medicine, 119(6), pp.492-502.

Roberts, G.W., 2004. Taking care of thyroxine. Australian Prescriber, 27(3), pp.75-6.

Rosenbaum, R.L. and Barzel, U.S., 1982. Levothyroxine replacement dose for primary hypothyroidism decreases with age. Annals of internal medicine, 96(1), pp.53-55.

Rosenbaum, R.L. and Barzel, U.S., 1982. Levothyroxine replacement dose for primary hypothyroidism decreases with age. Annals of internal medicine, 96(1), pp.53-55.

Saravanan, P., Chau, W.F., Roberts, N., Vedhara, K., Greenwood, R. and Dayan, C.M., 2002. Psychological well-being in patients on „adequate‟doses of l-thyroxine: results of a large, controlled community-based questionnaire study. Clinical endocrinology, 57(5), pp.577-585.

Sawin, C.T., Surks, M.I., London, M., Ranganathan, C. and LARSEN, P.R., 1984. Oral thyroxine: variation in biologic action and tablet content. Annals of internal medicine, 100(5), pp.641-645.

Sethi, B., Khandelwal, D. and Vyas, U., 2018. A cross-sectional survey to assess knowledge, attitude, and practices in patients with hypothyroidism in India. Thyroid Research and Practice, 15(1), p.15.

Simonin, R., San, J.M., Heim, M. and Brindisi, G., 1981. Treatment of primary hypothyroidism in adults: dosage schedule and biological surveillance (author's transl). La semaine des hopitaux:

organe fonde par l'Association d'enseignement medical des hopitaux de Paris, 57(37-38), pp.1480-1487.

Somasundaram, Dr. Henry Rajaratnam, Prof. Chandrika Wijeyarathne, Prof.Shamya De Silva, Prof. Channa Ratnathunga, Prof. Ranil Fernando, Prof. Sisira Siribaddana, Dr. Prasad Katulanda, Dr. Uditha Bulugahapitiya, Dr. Sajith Siyambalapitiya, Dr. Charles Antonypillai, Dr. Manilka Sumanathilake, Dr. Chaminda Garusinghe, Dr. Dimuthu Muthukuda, Dr. M. W. S. Niranjala, Dr. Muditha Weerakkody, Dr. Dharshini Karuppiah, Dr. Sivatharshya Pathmanathan, Dr. Sachith Abeyarathne, Dr. Shaminda Kahandawa, Dr. Samanthi Cooray, Dr. Kavinga Gunawardena, Dr. Nayananjani Karunasena., 2013. The Endocrine Society of Sri Lanka‟s CLINICAL GUIDELINES Thyroid Diseases.

Wenzel, K.W. and Kirschsieper, H.E., 1977. Aspects of the absorption of oral L-thyroxine in normal man. Metabolism-Clinical and Experimental, 26(1), pp.1-8