



A preliminary study on post surgical complications after thyroidectomy in Pulau Pinang, Malaysia

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Abstract

Thyroidectomy is surgical removal of a partial or complete thyroid gland in case of hyperthyroidism, thyroid cancer and goiter. This removal of thyroid gland could develop post-surgical complications. A retrospective study was done in Hospital Pulau Pinang by reviewing 30 medical records of the patients who had thyroid disease and undergone thyroidectomy. Random sampling was carried out by collecting patient medical records from January 2010 to December 2011. Demographic data such as sex, race, age, marital status and occupation were recorded. Diagnosis, type of thyroidectomy and complications occurred at post operative status were also recorded. A total of 30 patients undergoing thyroidectomy had been observed in this study. Socio-demographics data shows that 63.33% were females and 36.67% were males with multiple ethnics of 53.33% Chinese, 33.33% Malay and Indians 13.33%. The age of the patients was above 18 years with more than 60% ranging between 30 to 59 years and 76.67% were married. Mostly they work in private sector (53.33%), government (6.67%) and self-employed (6.67%). Solitary thyroid nodule, papillary thyroid carcinoma, and follicular thyroid lesions were among the major diagnosis. Only total thyroidectomy and hemithyroidectomy were employed for thyroid surgery. Among the post surgical complications, hypothyroidism, hypocalcaemia, hoarseness of voice and hematoma were mostly observed in the patients. Based on this preliminary study we found that Chinese female has high risk of getting thyroid disorders and had undergone thyroidectomy for their treatment. Solitary thyroid nodule is the highest reason for undertaking thyroidectomy followed by papillary thyroid cancer. Hypothyroidism and hypocalcemia were the common post surgical complications observed.

Key-Words: Thyroidectomy, Post surgical complications, Preliminary study, Pulau Pinang, Malaysia

Introduction

Endemic goiter is a great threat to health around the globe especially in South East Asia including Malaysia (Htwe, 2012 & Ministry of Health Malaysia, 1999). Seven states of Malaysia were reported with a high incidence of goiter namely Sabah, Sarawak, Kelantan, Terengganu, Pahang, Perlis and Kedah (Ministry of Health Malaysia, 1999). In West Malaysia, the incidence of multi-nodular goiter was 31.4% to 45.0% (Norhayati *et al.*, 2009). Occurrence of goiter was 31.8% in Sarawak while in Ai river area and Lemanak river area had occurrence of goiter 36.9% and 26.5% respectively (Foo *et al.*, 1994). However, according to study done on rural Malay adult females residing at the borders of Kuala Lumpur had the goiter occurrence of 24.5% (Osman & Zaleha, 1995).

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Frequency of thyroid disorders varies with iodine intake (Jayne & Kristien, 2012). Iodine is essential for the production of thyroid hormones and growth and recommended dietary allowance of iodine is 150ug/day for children and adults and 1.5 billion individuals belonging to 118 different countries were calculated to be at risk of iodine deficiency in 1994 (Delange, 1998). Thyroidectomy is surgical procedure employed to reduce the complications related to different types of thyroid disorders such as proven or suspected thyroid malignancy, retrosternal goiter, uncontrolled hyperthyroidism, Hashimoto's disease, hypothyroidism with suspicion of superimposed lymphoma and manage them appropriately by removing thyroid gland partially or completely depending upon the severity of the thyroid disease (Farling, 2000; Marry, 2002). At the start of 20th century, thyroidectomy was highly morbid and at times also mortal. Though, establishment of anesthetic and antiseptic techniques and surgical

procedures had made thyroidectomy safe and beneficial with decreased morbidity and zero mortality (Moulton *et al*, 1997). At present, recurrent laryngeal nerve palsy (RLNP), hypothyroidism and hypoparathyroidism were basic problems after thyroidectomy (Richard, 2009; Stavros *et al*, 2010) but patients having obesity, under-nutrition and habit of smoking were at more risk generally. Hoarseness or voice loss was the complication related to surgical procedure in case of laryngeal nerve damage, mostly happened during operations for large goiters or cancerous tumors. Similarly, hypoparathyroidism was also possible in case of damage or removal of parathyroid glands and obviously hypothyroidism was seen in case of removal of portion or all of the thyroid gland specifically while treating cancer. (Mary, 2002).

Methodology

Study design and location

This was a preliminary study conducted in Surgery Department of Hospital Pulau Pinang, Malaysia. Retrospective data was collected in order to attain the objectives of study. Thus this study was designed to have an idea of the current situation of complications observed after thyroidectomy, distribution of the thyroid disorders according to the socio-demographic profiles of the patients, nature of the thyroid disorders among the patients, type of the thyroidectomy performed in the Hospital Pulau Pinang, Malaysia. Random sampling was carried out by collecting 30 from 60 patient's medical record in January 2010 to December 2011.

Exclusions and inclusions criteria

Registered cases of thyroidectomy with thyroid disease were included into the study population and patients were Malaysian citizen with no specific age range, both males and females were included as well. Patients with thyroid disease that have not undergone thyroidectomy and were not Malaysian citizens were excluded.

Research tool and data analysis

Self developed data collection form was used to record the data. Demographic data was recorded such as sex, race, age, marital status and occupation. Diagnosis and type of thyroidectomy were recorded as well including any complication occurred at post operative status for the purpose of analysis. Collected data was processed statistically by using software name statistical package for social sciences version 17.0 (SPSS 17.0) and frequency distribution was analyzed.

Ethical approval

This study was approved by Ministry of Health Malaysia and the Clinical Research Committee (CRC) of Penang General Hospital.

Results and Discussion

Data from the thirty patient profiles were taken with the history of thyroidectomy including nineteen females and eleven males. According to the ethnic distribution 53.33% of them were Chinese, 33.33% were Malay and 13.33% were Indians. Majority of the patients belong to the age ranging from 30 to 59 years with median age of 47.5 years. Majority of them were married 76.67% and 53.33% were occupied in the private sector.

Solitary thyroid nodule (uni-nodular goiter) was found to be the major diagnosis among 30% of the patients undergoing thyroidectomy and high portion of them were females 66.6%, followed by the papillary thyroid carcinoma diagnosed among 26.66% patients and follicular thyroid carcinoma among 20% of the patients respectively. Rest of the diagnosis includes thyroid cyst 10%, multi-nodular goiter 10% and thyrotoxicosis 3.33%. Only two types of surgery was performed with 50% of the patients undergone total thyroidectomy and the remaining 50% had undergone hemithyroidectomy. Also it was seen that total thyroidectomy was performed mostly for all types of thyroid carcinomas.

Complications after thyroidectomy included hypothyroidism among 50%, hypocalcemia among 26.67% of the patients. Re-current surgery leading to completion thyroidectomy due to hematoma was observed in 6.67% of patients. Other complications found were hoarseness of voice 13.3% and sore throat 3.33%.

This study results show that out of total 9 cases of solitary thyroid nodule, 8 had undergone hemithyroidectomy. However in case of papillary thyroid carcinoma and multinodular goiter, the treatment of choice observed was total thyroidectomy in 100% of the cases while all the cases of thyroid cyst was treated with hemithyroidectomy.

Thyroidectomy was rare procedure until the end of 19th century (Gough & Wilkinson, 2000). However currently, it is the most frequent endocrine procedure and thyroid nodule is the most general of thyroid disorder (Christoper, 2010). In this preliminary study, solitary thyroid nodule was found to be the highest among the diagnosis in study population as also declared by Abdullah (2002) also. Papillary cancer was higher than follicular cancer as the type of thyroid cancer among study population. These findings were similar with older studies as Papaqeorqiou *et al* (2010) stated papillary cancer 56.3% and follicular 43.8% and Abdullah (2002) mentioned papillary cancer 69.0% and follicular cancer 21.5% among the diagnosis. Papillary cancer is the commonest thyroid malignancies making

more than 70% of the malignancies worldwide (Dorairajan *et al.*, 2002).

This study shows that thyroid disorders were present among females more than males. Vanderpump (2011) also mentioned that more female undergone surgery as compared to males (5:3). These results were comparable with another study done in Malaysia mentioning 85% of the study population was females (Abdullah, 2002). Abdullah (2002) mentioned in his study that there were equal distribution between Malay (36.44%) and Chinese (36.44%) ethnics meanwhile Indians were 22.42%, whereas there is a slight difference in the results of this study that Chinese being the highest in proportion 53.33%, Malays 33.33% and Indians were 13.33%. Also another contradiction was observed with Abdullah (2002) that according to his study incidence of follicular cancer was higher in Malays 56.5% than in Chinese 22.0% but in this study higher incidence of follicular cancer was seen among Chinese 13.33% than Malays 3.33%. Possible reasons behind could be the lower sample size of this study, difference in the premises of study as in Pulau Pinang 50% of the population were Chinese and also Abdullah (2002) performed the study specifically on the thyroid cancer patients who undergone thyroidectomy as his study population while this study includes all types of thyroid disorders patients undergoing thyroidectomy.

Hypothyroidism, hypoparathyroidism and recurrent laryngeal nerve palsy (RLNP) were the basic complications observed after thyroidectomy (Richard, 2009 & Stavros, 2010). Our study also reported hypothyroidism was the highest complication among patients followed by hypocalcemia and hoarseness of voice. Hypothyroidism was found in all the patients undergoing total thyroidectomy. Hypocalcemia may occur due to damage or removal of parathyroid gland (Mary, 2002) and also in case of only bruises over parathyroid gland during surgery leading to hypocalcemia lasting for few days to weeks (Ain & Rosenthal, 2005). This study gives result that hypocalcemia was present among ten patients who had total thyroidectomy.

The protruded portion of laryngeal nerve can be damaged if not taken cared properly leading to weakness of the high pitch of voice (Frank & Jeffrey, 2011; Jeffrey *et al.*, 2011). One-sided recurrent laryngeal nerve (RLN) injury leads to hoarseness of voice, mostly RLN injury occurs in case of re-operative procedure for complicated goiter or Grave's disease and for localized cancers (Frank & Jeffrey, 2011; Jeffrey *et al.*, 2011). This preliminary study shows that four patients suffer from hoarseness of voices after surgery, two patients had total thyroidectomy for

papillary thyroid cancer localized and rest two patients had hemithyroidectomy for solitary thyroid nodule treatment without re-operative procedure. RLN injury leading to hoarseness of voice could finish within 4 to 6 weeks injury otherwise repaired with nerve grafting but warranty of this unknown. (Frank & Jeffrey, 2011; Jeffrey *et al.*, 2011). However, according to Jeonghun *et al.* (2012), hoarseness of voice normalizes after 3 months of surgery in case of no laryngeal nerve injury. Occurrence of hematoma was found to be 6.67% which was higher than previous available evidence as in a study conducted by Brian *et al.* in 2012 reported out of total of 3,086 patients incidence of hematoma was found to be 0.7%, which may be possibly due to the small sample size of this preliminary study.

Total thyroidectomy had been employed for all thyroid carcinomas and certain non malignant thyroid disorders mostly and before undergoing surgery lot of discussions was done before selecting the type of surgery. Primary purpose of total thyroidectomy was to avoid the recurrence of tumor and complications and it is associated with less risk as compared to subtotal or near total thyroidectomy which would be acceptable in trade-off for decreased long-term mortality (Jay *et al.*, 1986). Our study also found that majority of the complications were observed in the patients who undergone total thyroidectomy.

Conclusion

This study concludes that hypothyroidism, hypocalcemia and hoarseness of voice were common post surgical complications among thyroidectomy patients and majority of the complications were present among the total thyroidectomy patients.

Limitations

As it was only a preliminary study with small sample size which is not representing the population of Pulau Pinang therefore the results could be bias however it gives an insight into the present scenario and platform for future research towards the raised new issues.

Recommendation for the future research

Design studies using a larger sample size representing the population of Pulau Pinang which will provide clear picture of consequences of thyroidectomy in Pulau Pinang by using more in depth statistical analysis.

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Table 1: Socio-demographic among thyroidectomy patients

Socio-demographic		n	%
Sex	Female	19	63.33
	Male	11	36.67
Race	Chinese	16	53.33
	Malay	10	33.33
	India	4	13.33
Age (years) Median = 47.5	20-29	3	10.00
	30-39	8	26.67
	40-49	7	23.33
	50-59	8	26.67
	60-69	3	10.00
	70-79	1	3.33
Marital status	Married	23	76.67
	Single	7	23.33
Occupation	Private	16	53.33
	Others*	10	33.33
	Government	2	6.67
	Own	2	6.67

*Others: students, housewife and unemployed

Table 2: Diagnosis, type of thyroidectomy and post surgical complication among study population

	Total thyroidectomy n (%)	Hemithyroidectomy n (%)	Total n (%)
Diagnosis			
Solitary thyroid nodule	1 (3.33)	8 (26.66)	9 (30.00)
Papillary thyroid cancer	8 (26.66)	0 (0.00)	8 (26.66)
Follicular thyroid lesions	4 (13.33)	2 (6.67)	6 (20.00)
Thyroid cyst	0 (0.00)	3 (10.00)	3 (10.00)
Multinodular goiter	3 (10.00)	0 (0.00)	3 (10.00)
thyrotoxicosis	0 (0.00)	1 (3.33)	1 (3.33)
Complication			
Hypothyroidism	15 (50.00)	0 (0.00)	15 (50.00)
Hypocalcaemia	8 (26.67)	0 (0.00)	8 (26.67)
Hoarseness of voice	2 (6.67)	2 (6.67)	4 (13.33)
Hematoma	2 (6.67)	0 (0.00)	2 (6.67)
Sore throat	0 (0.00)	1 (3.33)	1 (3.33)
Total n (%)	15 (50.00)	15 (50.00)	