Original Article

Myasthenia Gravis

Frequency of Thymoma in Thymectomy Specimens in Myasthenic Patients

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ABSTRACT

Objective: This study was carried out to determine the frequency of thymoma in different age groups and sexes in thymectomy specimens in Myasthenia Gravis patients.

Study Design: Observational study

Place and Duration of Study; The study was carried out in General Surgery Department at PIMS over a period of three years from 2009-2012. PIMS is a tertiary care centre where large population of Islamabad and Surrounding territory, including AJK, Gilgit Baltistan, Hazara division, Peshwar and nearby districts of Punjab gets treatment .

Materials and Methods: A total of 30 patients selected at random, were included in this study. Patients were of different age groups, above 12 and under 52 years of either sex. Patients with poor medical control of disease with no contra indication for surgery. Patients with operable mediastinal mass (thymoma) were included. Generalized myasthenia gravis was diagnosed in patients. Pre-operative plasmaphoresis was carried out in all patients. Transsternal approach was used in all cases although now video assisted thoracoscopic thymectomy is becoming popular. Intraoperative findings were noted with emphasis on gross appearance and an information by histopathological report (frozen section).

Results: In our study 17 % thymectomy specimens turned out to be Thymoma. Male to female ratio was 3:2. Age range was 12 years to 52 years.

Conclusion: All patients undergoing thymectomy for Myasthenia Gravis don't have thymoma. Moreover all Thymomas are not associated with Myasthenia Gravis. Ages between 3rd to 5th decade are affected by thymoma and gender difference is very little.

Key Words: Myasthenia gravis, Thymectomy, Thymoma

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INTRODUCTION

As is evident from the name, Myasthenia Gravis (MG) means grave muscular asthenia[1] (derived from Greek and Latin words).

Fluctuating weakness of muscle groups which is hall mark of MG is caused by a chronic autoimmune neuromuscular junction disorder.

In United States its prevalence is about 20/100,000 population[2]. It affects males and females of all races and all age groups. It is not contagious and is thought not to be directly inherited[3].

Common symptoms of the disease may include dysphagia, dysphasia, weakness of arms and legs, a drooping eyelid, blurred vision, and chronic muscular weakness. In extreme cases patient may develop difficulty in breathing[4].

In 85% of the cases of MG by Acetyl Choline Receptor antibodies[5] are cause of this neuromuscular disease. Thymoma accompanies MG 15% of all MG cases[6] .

The immune response against an epitope expressed on thymoma cells spills over to neuromuscular junction components sharing the same epitope[7] .

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Although most thymomas are benign , but these should be removed otherwise It may invade locally. In fact, thymectomy is otherwise also indicated to treat MG even if no neoplastic lesion is there because it does improve features of Myasthenia Gravis in some patients, even in absence of tumour [8].

Thymoma is a rare tumor, found out during thymectomy in myasthenic patients, we specially emphasize on frequency of thymoma in different age groups and sexes.

Thymic tumours arise from epithelial cells, and are mostly of the cortical subtype[9]. 50% of thymoma patients develop MG. Such cases are called Thymoma MG. This study was carried out to know about incidence of thymoma in thymectomies carried out for myasthenia gravis.

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MATERIALS AND METHODS

This observational study was carried out at PIMS Islamabad on the cases admitted in the Deptt. of General Surgery and referred from medical/neurology departments from 01-01-2010 to 31-12-2012.

- A total of 30 patients selected for surgery.
- A detailed history of all patients who were referred from neurology department of hospital was taken and thorough clinical examination was carried out.
- Patients with an operable mediastinal mass were included.
- Patients included in study were with poor medical control of disease and with no contra indication
- for surgery.
- Generalized myasthenia gravis was diagnosed in all these patients.
- All included were under 52 years and over 12 years of age.
- 16 patients were males and 14 were females.
- Pre-operative plasmaphoresis was carried out in all patients.
- Trans sternal surgical approach was used in all patients.
- Intra-operative findings were noted with emphasis on gross appearance and histo-pathological examination (frozen section).

Following investigation were carried out
Non-specific tests

- Blood Complete Picture
- Urine R/E.
- Renal Function tests
- Blood sugar level
- ECG
- Blood grouping and cross matching.
- HBsAg , Anti Hcv ,Screening.

Specific tests

- **Tensilon test**. (In Myasthenic patients Tensilon test will be positive. It evaluates the
- Response of muscles to a drug Tensilon (Edrophonium Chloride). Edrophonium blocks
- the action of acetylcholine esterase and thus can prolong muscle stimulation and temporarily
- improve muscle strength. An increase in muscle strength after an injection of Tensilon strongly
- suggests a diagnosis of Myasthenia Gravis.)
- **EMG** (a single repetitive stimulus-) In repetitive stimulation studies there was decremental
- response in compound muscle either before or after exercise (Rouwland 1984)
- Chest X-ray
- Tomograms
- CT Scan of chest.

(Chest X-ray, Tomograms and CT scans were done to assess any widening of mediastinum resulting from thymic hyperplasia, thymoma and involvement of surrounding structures, pleura and pericardium by thymic seedling).

RESULTS

In our study, total patients were 30, out 0f which 5 patients were found to be having thymoma, 1 patient had atrophic thymus and 24 patient had hyperplasia. This study revealed that frequency of thymoma is about 17%, about 3% atrophic thymus and 80% patients have hyperplasia of thymus. (Table 1 to Table 4).

Table No.1: Histopathalogical types of disease in thymus

	H Histopathology	Number of Patients	Percentage
A	Thymic hyperplasia	24	80 %
B	Thymic tumor (thymoma)	5	17 %
C	Atrophic thymus (atrophic)	1	3 %

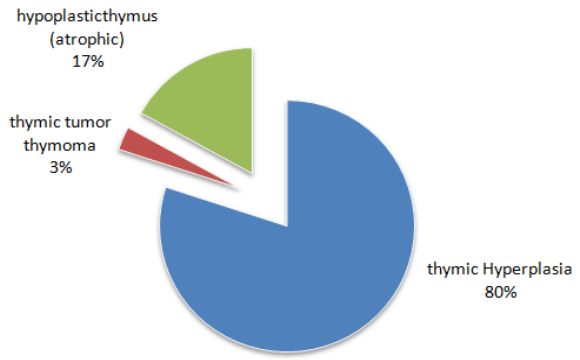

Figure No.1:Histopathalogical types of disease in thymus

There were five patients of thymoma and their ages were, 40 year female, 52 year male, 32 year male, 45 year male and 35 year female Which indicated that thymoma was found mostly in 3rd, 4th, 5thdecades.

Table No.2: Frequency of thymoma at different ages

1	40 year female	1
2	52 year male	1
3	32 year male	1
4	45 year male	1
5	35 year female	1
Total		5

Table No.3: Frequency of thymoma at different age ranges

Age Range	Total Patients	Male	Female
30 - 40	3	1	2
40 - 50	1	1	0

Table No.4: Frequency of thymoma at different sex

Total patients	Male	%age	Female	%age
5	3	60%	2	40%

It also indicates that thymoma frequency is higher in male above 40 year and in females below 40 year age.

Indications of thymectomy in this study

- Inadequate response to medical treatment --10
- Development of side effects to drugs --3
- Mediastinal widening (CxR/ CT) findings --17
- Total patients --30

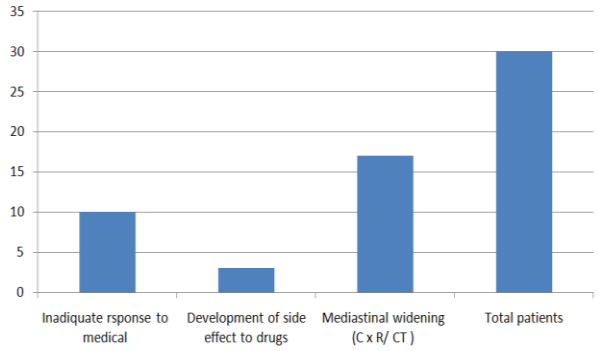

Figure No.2: Indications of thymectomy

DISCUSSION

The total study was carried out to find the frequency of thymoma in different age groups and sexes of myasthenic patients through sternotmy. Although thymic neoplasia[10] are cured well by radical excision, symptoms of MG may persist. In such patients continuous clinicolaboratory follow up is necessary. They may require continuous drug treatment[11]. Oncological treatment is necessary[12] in case thymoma has invaded local structures. A course of plasmapheresis or intravenous immunoglobulin (iv-IgG) given before surgical excision helps in decreasing pathogenic antibodies[13].

We recorded 30 patients of which 16 patientswere male and 14 were female. This sex ratio of patients which was referred to us and underwent surgery for thymectomy was slightly in favor of a higher male ratio. Besides pharmacological treatment thymectomy is the only surgical treatment Myasthenia Gravis worldwide and in about one fifth of thymectomy specimens thymoma may be encountered[14].

In order to avoid MG exacerbation and myasthenic crisis[15]after thymus removal intravenous Ig G or plasmaphoresis is done in various surgical centers. Iv-IgG is better alternative of plasmaphoresis[16] in patients at high risk of fluid overload causing cardiopulmonary failure.

Patients older than 45 years with thymoma MG[17,18] yield unsatisfactory results.

Comparative studies at different places for Frequency of thymoma

No	Place of research	Reference	Total Pati patients	Thymoma		% of thyThymoma
				Positive	Negative	
1	Mayo Clinic 1991	Cited by nevi 1992	206	43	153	20.87
2	Agha Khan University 199	Ali et al,1992	13	3	10	23
3	National Utano Hospital 199	Ito-M et al, 1992	133	18	115	13.50
4	Chirirginselspital Bern Germany, 1991		24	2	22	8.33
5	USA 1991 (Cancer 1992 Jul, 15: 70(20) 443-50	Wangg LS, et al,1992	61	9	52	14.70
6	University hospital Groningen Netherland, 1991	Kuks Jb, et al, 11992	86	19	63	23.17
7	Denmark, 1992	Lindberg, et al, 11992	86	12	74	13.95
8	Switzerland, 1992	Aarili JA, et al, 11992	64	8	57	12.50
9	Pakistan PIMS	Sikandar, et al	30	5	25	16.66

After confirmation of neoplastic lesion in a patient with Myasthenia Gravis radical excision of the neoplasm[19,20] should be ensured through conventional transsternal approach or using video-assisted thoracoscopic technique. Both usually give similar results[21].

Those patients who have MG for less than five years benefit most from thymectomy.[22]

Sex Ratio in Patients of Thymoma

Number of male patients : number of female patients

3 : 2

Male : female ratio

3 : 2

1 : 5

In our study there was higher female ratio below forty and higher male ratio above forty. Percentage of thymoma in our study was about 17% which is not far different from other studies which were carried out in different hospitals at various time given in table above.[23]

CONCLUSION

We conclude that trans sternal or thoracoscopic (where expertise and technological facility exists) thymectomy is established surgical treatment of Myasthenia Gravis and incidence of thymoma is about one fifth in such thymectomy specimens. Whenever encountered, Thymoma should be excise radically. Both sexes are affected but males above forty are affected more by thymoma in our study.

Conflict of Interest: This study has no conflict of interest to declare by any author.

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