



A Study on Association of Multiple Myeloma with Past Medical and Family History – A Hospital Based Study at A Government Medical College, Guwahati, Assam

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Introduction

Multiple myeloma is a clonal plasma cell malignancy characterized by the proliferation of neoplastic plasma cells. Its Incidence rates increase with age, particularly after age 40, and are higher in men. More importantly, delineation of the mechanisms mediating plasma cell proliferation, survival and migration in the bone marrow microenvironment may enhance the understanding of pathogenesis, and a better understanding of the molecular pathogenesis is fundamental for developing more effective prognostic, therapeutic and preventive approaches.

Material And Methods

This study is based on studies conducted on “A Study on Association of Multiple Myeloma with Past Medical and Family History – a Hospital Based Study at a Government Medical College, Guwahati, Assam ”. A total of 100 cases were studied in the Out Patient Department (OPD) of the Clinical Haematology Department, Gauhati Medical College & Hospital, and Guwahati, Assam. Being a descriptive study, the data were procured from the

OPD of the same department. Research type - Hospital based cross-sectional descriptive study. **Study setting** - the present study has been undertaken in the Out Patient Department of the Clinical Haematology Department of Gauhati Medical College & Hospital, Guwahati, Assam. Study period - the study period was three years commencing from November, 2010 to October, 2013. **Study population** - the study population comprise of 100 numbers of newly diagnosed cases of MM attending the OPD of the Clinical Haematology Department of Gauhati Medical College & Hospital, Guwahati, Assam during the period of November, 2010 to October, 2013. Before undergoing the study clearance from institutional ethical committee was obtained. Analysis of data was done in the year 2014-15. **The sample** - Sample size of 100 number of newly diagnosed MM patients were taken into the study during the period of November, 2010 to October, 2013. **Selection of cases** - We have taken all the newly diagnosed cases of MM into the study attending at OPD of the Clinical Haematology Department of Gauhati Medical College & Hospital, Guwahati, Assam during the

period of November, 2010 to October, 2013. Initially patients were selected purely on clinical ground and then negative cases were excluded after diagnosis based on International Myeloma Working Group (IMWG) criteria for diagnosis of monoclonal gammopathys. **Inclusion criteria** - One hundred newly diagnosed cases of MM of all age group from November, 2010 to October, 2103. **Exclusion criteria** – (1) Old diagnosed cases of MM that are under treatment. (2) Monoclonal gammopathys of undetermined significance (MGUS) (3) Asymptomatic (smoldering) MM. **Protocol** - The proforma was prepared based on universal standard protocols for evaluation of multiple myeloma which contains separate history, examination and investigation parts. The International Myeloma Working Group.(IMWK) criteria for classification of monoclonal gammopathys, multiple myeloma and related disorders were used for diagnosis of the disease. During the study period Immunofixation electrophoresis test (for serum/urine) was not available in the institute. So this test was not included into the study. Then staging was made according to International Staging System (ISS). Performance status of patients was made according to Eastern Co-operative Oncology Group (ECOG) standard performance protocol (Appendix-1). **Methods** –Details of the patient - Details of the patients were recorded in the manner in order of age, sex, religion, caste, occupation, address, hospital number and registration number for identification and documentation. When patients were first examined a detailed history was taken and thorough clinical examination was done. Then they underwent a battery of investigations to confirm diagnosis. All the patient’s history, clinical examination, investigation findings, and diagnosis data were recorded in a pre-designed and pre-tested proforma. **Statistical analysis** - data were analysed using statistical package

and results and observations were presented in tabular form. Statistical tests were applied wherever required.

Results and Observations

1. Distribution of past medical history of the patients

N=100

Past medical history	Males		Females		Total	
	No.s	%	No.s	%	No.s	%
Pneumonia	16	23.89	11	33.33	27	27
Eczema	4	5.97	3	9.09	7	7
Pulmonary tuberculosis	3	4.48	2	6.06	5	5
Shingles (herpes zoster)	1	1.49	00	00	1	1
Hepatitis C infection	1	1.49	00	00	1	1
Venereal disease	1	1.49	00	00	1	1
Others (minor diseases)	41	61.19	17	51.51	58	58
Total	67	100	33	100	100	100

Table-1: Distribution of past medical history of the patients

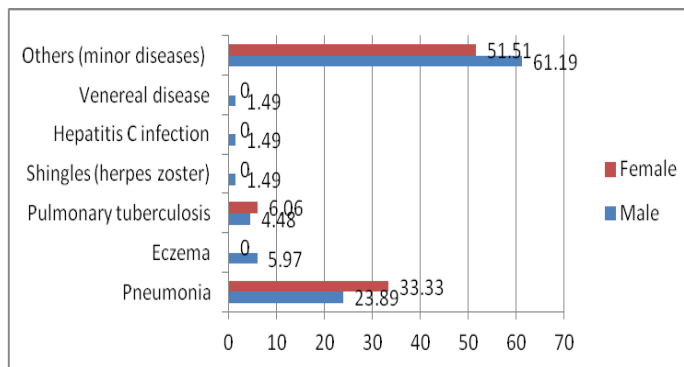


Figure -1: Bar diagram showing distribution of past medical history of the patients

The table-1 shows that 58 (58%) patients had history of minor diseases, 27 (27%) patients had history of pneumonia, 7 (7%) patient had history of eczema, 5 (5%) patient had history of pulmonary tuberculosis and 1 (1%) patient had history of Shingles (herpes zoster), hepatitis C virus infection and venereal disease each. The statistical analysis from the table-1 suggest that there exists significant difference (p=0.0001) in the number of patients with reference to past history of certain diseases.

Also a group with a significant number of patients is found to have minor diseases only in the past medical history. (Test statistics: ‘Z’ test for differences of two proportions)

2. Distribution of family history of MM of the patients N=100

Family history of multiple myeloma	Males		Females		Total	
	No.s	%	No.s	%	No.s	%
Yes	1	1.49	00	00	1	1
No	66	98.51	33	100	99	99
Total	67	100	33	100	100	100

Table -2: Distribution of family history of MM of the patients

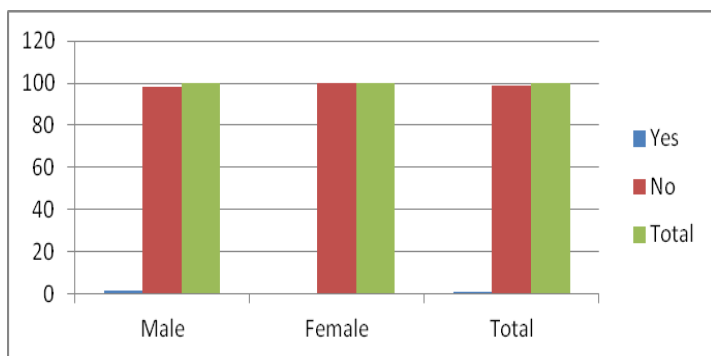


Figure -2: Bar diagram showing distribution family history MM of the patients

The table-2 shows that only 1 (1%) patient had family history of MM. The statistical analysis from the table-2 reveals that the family history of MM has no effect ($p>0.00001$) on the prevalence of the disease. (Test statistics: ‘Z’ test for differences of two proportion, calculated value of ‘Z’=9.8)

3. Distribution of frequency of family history of other diseases of the patients N = 100

Frequency of family history of other diseases the patients	Males		Females		Total	
	No.s	%	No.s	%	No.s	%
Rheumatoid arthritis	00	00	1	3.03	1	1
Breast cancer	1	1.49	00	00	1	1
Lung cancer	1	1.49	00	00	1	1
No diseases	65	97.02	32	96.97	97	97
Total	67	100	33	100	100	100

Table -3: Distribution of frequency of family history of other diseases of the patients

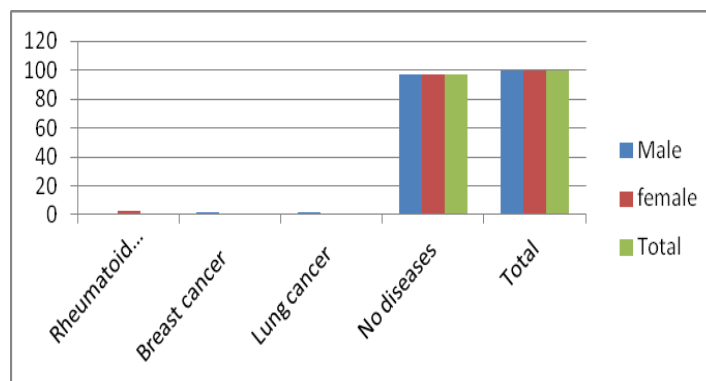


Figure -3: Bar diagram showing Distribution of frequency of family history of other diseases of the patients

The table-3 shows that 1 (1%) patient had family history of rheumatoid arthritis, breast cancer and lung cancer each. However, 97 (97%) patients did not have family history of other disease. The statistical analysis from the table-3 reveals that though the patients have some other diseases also, the number is very insignificant as compared to the patients with no such diseases. From this we can infer that the other disease under consideration does not have significant effect ($P=0.00001$) on the prevalence of MM. (Test statistics: ‘Z’ test for differences of two proportions)

Discussion

1. Past medical history of the patients

In the present study 58 (58%) patients had past history of minor diseases, 27 (27%) patients had past history of

pneumonia, 7 (7%) patient had past history of eczema, 5 (5%) patient had past history of pulmonary tuberculosis and 1 (1%) patient had past history of Shingles (herpes zoster), hepatitis C virus infection and venereal disease each. Statistical analysis suggest that there exists significant difference ($p=0.0001$) in the number of patients with reference to past history of certain diseases. Also a group with a significant number of patients is found to have minor diseases only in the past medical history.

2: Pneumonia

Søgaard KK et al. (2014)¹ and Brown LM et al. (2008)² have shown that myeloma risk is higher in people with previous pneumonia. Thus the present study results in this aspect are comparable with these studies.

3: Eczema

Doody MM et al. (1992)³ reported positive association (OR 5 2.0, 95% CI: 1.1–4.0) of MM for history of eczema but this finding was not supported by Lewis DR et al. (1994)⁴ and Cuzick J. and De Stavola B (1998).⁵ Thus the present study results in this aspect are comparable with these studies.

4: Pulmonary tuberculosis

Lewis DR et al. (1994)⁴ and Doody MM et al. (1992)³ demonstrated insignificant relative risks of multiple myeloma ranging from 1.1 to 2.2 for history of tuberculosis. Thus the present study results in this aspect are comparable with these studies.

5: Shingles (herpes zoster)

Heinemann E.F et al. (1992a)⁶ reported significantly positive association of Shingles (herpes zoster) and MM ranging from 1.2 to 2.6 while insignificant association was proposed by Lewis DR et al. (1994)⁴ and Cuzick J. and De Stavola B (1988).⁵ Thus the present study results in this aspect are comparable with these studies.

6: Hepatitis C infection

Duberg AS et al.(2005)⁷ reported association of hepatitis-C virus infection and MM. Thus the present study results in this aspect are comparable with this study.

7: Family history of multiple myeloma of the patients

In the present study only 1 (1%) patient had family history of MM. Statistical analysis reveals that the family history of MM has no effect ($p>0.00001$) on the prevalence of the disease. Lynch HT et al. (2008)⁸ has demonstrated that the overall risk of MM in first degree relatives of persons with MM is reported to be increased by a factor of two to four. Similarly, Hemminki K et al (2004)⁹ using the Swedish nationwide family cancer database, has been demonstrated an excess risk of MM in offspring of parents who were previously diagnosed with multiple myeloma (SIR 5 3.33, 95% CI: 2.11–5.00). Thus, although our study findings are statistically insignificant it is comparable with these studies.

8: Family history of other diseases of patients

In the present study one (1%) patient had family history of rheumatoid arthritis, breast cancer and lung cancer each. However, 97 (97%) patients did not have family history of other disease. Statistical analysis reveals that though the patients have some other diseases also, the number is very insignificant as compared to the patients with no such diseases. From this we can infer that the other disease under consideration do not have significant effect ($P=0.00001$) on the prevalence of MM. Grufferman S et al.(1989)¹⁰ reported association of MM with family history of rheumatoid arthritis, breast cancer and lung cancer. So our study has similar observation with the study. Thus, although our study findings are statistically insignificant it is comparable with the Grufferman S et al (1989)¹⁰'s study Thus, although our study findings are statistically insignificant it is comparable with these studies.

Conclusion

Past history of Pneumonia, Hepatitis C infection has positive association while eczema has both positive and negative association for developing MM. Both positive and negative association – Eczema. Similarly, insignificant relative risks of developing MM are – pulmonary tuberculosis, family history of rheumatoid arthritis, breast cancer and lung cancer. Both significant and insignificant relative risks of developing MM are - Shingles (herpes zoster). Family histories of MM of first degree relatives have significant risk for developing MM.

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