International Journal of Otorhinolaryngology and Head and Neck Surgery
Ivaturi PB et al. Int J Otorhinolaryngol Head Neck Surg. 2018 May;4(3):770-775
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20181869

Original Research Article

A study on profile of patients with parotid swellings attending infectious disease hospital, Hyderabad, Telangana

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Received: 23 February 2018
Accepted: 26 March 2018

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ABSTRACT

Background: Mumps is an acute infectious disease caused by RNA virus. Clinically, the disease is presented as non suppurative enlargement and tenderness of one or both the parotid glands. The annual incidence of mumps in the absence of immunization is in the range of 100-1000 cases/100000 population. Mumps mostly occurs in children in age group of 5-9 years. The objectives of the study were to describe the epidemiological factors of cases admitted with parotid swelling; to describe the clinical features of patients admitted with parotid swelling; to assess the demographic factors in relation to complications.
Methods: A cross sectional record based retrospective study was carried out at Sir Ronald Ross Institute of Tropical and Communicable Diseases, Hyderabad. All the cases admitted in year 2016 with unilateral or bilateral parotid swellings were included in the study. The study was carried out for 2 months.
Results: The mean age of study population in present study was found to be 11.23 years. Around 35.9% of cases were found in the age group of 6-10 years. Males constituted 53.9% of study population and females were 46.1%. The mean duration between the onset of symptoms and admission in hospital was found to be 3.5 days. The most common clinical presentation was fever, parotid swelling and earache.
Conclusions: Control of Mumps is difficult as the disease is highly infectious. Long and variable incubation period along with subclinical cases makes the control difficult. However, routine MMR vaccination as part of national immunization schedule can help in be preventing the epidemics.

Keywords: Mumps, Parotid swelling, MMR vaccine, Subclinical cases

INTRODUCTION

Mumps or viral parotitis is a disease caused by Mumps which belongs to the genus *Rubulavirus* of the subfamily Paramyxovirinae in the family paramyxoviridae. Mumps is vaccine preventable disease and is endemic in most parts of the world.[1]

In most parts of the world, the annual incidence of mumps in the absence of immunization is in the range of 100-1000 cases/ 100,000 population with epidemic peak every 2-5 years.[2]

Mumps often occurs as a mild childhood disease affecting children between five and nine years of age. Incubation period is 2-3 weeks. Patients are usually infective even before the appearance of clinical manifestations and remains so 7-10 days after parotid swelling subsides. Infection among adults can occur as well and leads to serious complications. It is spread by airborne droplets released when an infected person sneezes or coughs and by direct contact with an infected person.[3]

The clinical features include fever, malaise, anorexia and muscular pain lasting for 3-5 days. Parotid swelling may appear initially on one side but the infection progresses to opposite parotid gland in no time. Submandibular and sublingual salivary glands may also be enlarged but isolated involvement of submandibular gland is rare. Earache and stiffness on opening mouth are also found before the swelling of parotid gland appears. Opening of stensen's duct is red and inflamed. Swelling may subside in 1- 2 weeks. The virus has a predilection for glandular and nervous tissue and may also affect testes, pancreas, CNS, ovaries, prostate etc. in severe cases.[1-4]

In the long run, mumps is one of the major causes of children's acquired sensorineural deafness, with an incidence of about 5/100 000.[5]

According to Integrated Disease surveillance program, a surveillance system of Government of India to detect and respond to disease outbreaks, a total of 72 outbreaks of mumps were reported in India during the period September 2009 to November 2014. A total of 1564 cases were reported during this period from various states and union territories of India.[6]

About 45 outbreaks of mumps have been reported from the different parts of the country in 2016.[7]

Vaccination is the best way to prevent mumps. Around 62% of countries have included mumps vaccine in their routine schedule in the form of MMR vaccine.[3]

This study was conducted to assess the clinical and epidemiological profile of clinical mumps such as the frequency in children and adults, seasonal variation, gender predisposition, rate of complications, relationship between complications and demographic factors.

Objectives of study

1. To describe the epidemiological factors of cases admitted with parotid swelling.
2. To describe the clinical features of patients admitted with parotid swelling.
3. To assess the demographic factors in relation to complications.

METHODS

The present study is a record based retrospective analysis of data available from January 2016 to December 2016 at Sir Ronald Ross Institute of Tropical & Communicable diseases (SRRITCD) / Govt. Fever Hospital, (tertiary care center) Hyderabad, India. Clinically suspected Mumps patient's identified in Hyderabad and neighboring districts are admitted to the Fever Hospital for treatment as it is the sentinel surveillance center for treatment. Criteria for case description for clinical and laboratory confirmed case was made as per World Health Organization (WHO) guidelines.

Case definition as per WHO guidelines[3]

Clinical mumps

Acute onset of unilateral or bilateral tender, self- limited swelling of the parotid or other salivary gland, lasting 2 or more days and without other apparent cause.

Laboratory confirmed mumps

A patient with clinical mumps and laboratory confirmation by positive-mumps IgM antibody(without mumps immunization in the previous 6 weeks) or; sero conversion with 4 fold or greater rise in mumps IgG titre; or isolation of mumps virus from saliva, urine or cerebrospinal fluid. Case classification

Clinical case: A case that meets the clinical case definition

Laboratory-confirmed: A case that meets the clinical case definition and is laboratory-confirmed

All the patients, who satisfied the clinical definition of Mumps as per WHO guidelines were included in the study. No laboratory confirmation was done for this study.

The study duration was for a period of 2 months. A pre tested and pre designed proforma was used to obtain information from medical records. The data was analyzed retrospectively with respect to demographic details, clinical features, and complications using MS excel and open epi.

Treatment protocol

All patients identified as clinical Mumps were given symptomatic treatment as per standard treatment protocol. The patients are given ibuprofen/acetaminophen for treatment of fever and pain along with warm saline mouth washes. Antibiotics like erythromycin or ampicillin were given in the presence of severe localized infection. Prednisolone was given orally for 4 days along with bed rest and scrotal support in cases of orchitis.

RESULTS

A total of 540 cases of clinical mumps or viral parotitis were reported from January 2016 – December 2016 at Sir Ronald Ross Institute of Tropical & Communicable diseases (SRRITCD) / Govt. Fever Hospital, (tertiary care center) Hyderabad, India.

The Mean age of study population is 11.23±10.1 years. Maximum incidence of disease (35.9%) was found in the age group of 6-10 years and around 31.3% was found in the age group of 0-5 years. The disease burden was found to show a declining trend as age increased to >20 years.

The youngest case was 9 months old and the oldest study subject was 82 years old.

Table 1: Distribution of study population according to age.

Age group (in years)	Number	%
0-5	169	31.3
6-10	194	35.9
11-15	59	10.9
16-20	36	6.7
21-25	26	4.8
26-30	26	4.8
31-35	10	1.9
36-40	9	1.7
41-45	6	1.1
46-50	3	0.5
>50	2	0.4
Total	540	100

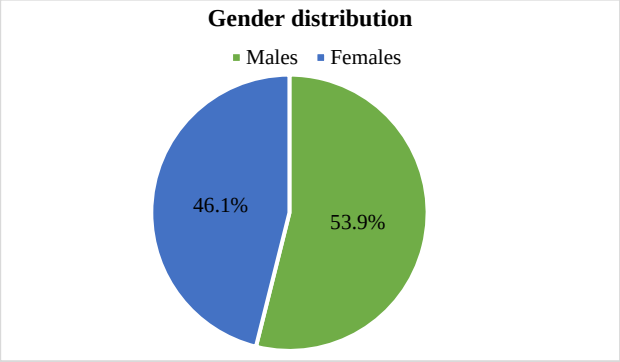

Figure 1: Distribution of study population according to gender.

In the present study, the disease was found to be higher among Males (53.9%) as compared to females (46.1%).

Table 2: Distribution of study population according to age and gender.

Age group (in years)	Males (%)	Females (%)	Total (%)
0-5	106 (19.6)	63 (11.7)	169 (31.3)
6-10	109 (20.2)	85 (15.7)	194 (35.9)
11-15	29 (5.4)	30 (5.5)	59 (10.9)
16-20	15 (2.8)	21 (3.9)	36 (6.7)
21-25	7 (1.3)	19 (3.5)	26 (4.8)
26-30	10 (1.8)	16 (3)	26 (4.8)
31-35	6 (1.1)	4 (0.8)	10 (1.9)
36-40	6 (1.1)	3 (0.6)	9 (1.7)
41-45	1 (0.2)	5 (0.9)	6 (1.1)
46-50	1 (0.2)	2 (0.3)	3 (0.5)
>50	1 (0.2)	1 (0.2)	2 (0.4)
Total	291 (53.9)	249 (46.1)	540 (100)

In the present study, it was found that in the younger age groups (0-10 years) the disease burden was higher among males (39.8%) when compared to females (27.4%). The disease showed a slightly higher preponderance in the age group of 16-30 years among females (10.4%) when compared to males (5.9%).

Table 3: Relationship between gender and age of onset of disease.

Age group	Males (%)	Females (%)	Total (%)
0-10 years	215 (59.2)	148 (40.8)	363 (100)
>10 years	76 (42.9)	101 (57.1)	177 (100)
Total	291 (53.9)	249 (46.1)	540 (100)

Using chi square test of significance, chi square value – 12.71, $p<0.001$.

The difference of disease burden in the age group of 0-10 years and >10 years among males and females was found to be statistically highly significant ($p<0.0001$).

In the present study it was found that mumps was higher among Muslims (58.3%) followed by Hindus (31.9%) and was least among Christians (9.8%).Most of the cases reported were from Hyderabad City (92.4%) and around 7.6% were from other districts of the state. In the present study it was found that the mean duration between onset of symptoms and first contact with health centre was 4–5 days. The mean duration between admission and discharge was found to be 8 days.

In the present study it was found that around 85.3% of cases were among students and dependents (<3 years old). Around 9.1% of cases were seen among housewives and 5.6% of cases were found among other occupations.

In the present study, more than half the cases (58.3%) were reported in the months of January –April (corresponding to spring and early summer season). Around 17% of cases were in the month of April, followed by March (16.5%), and 13.1% were in month of February and 11.7% in the month of January. Least number of cases were reported in the month of July (1.9%).

Table 4: Distribution of study population according to clinical features.

Clinical features	Number	%
Fever	492	91.1
Unilateral parotid swelling	540	100
Bilateral parotid swelling	498	92.2
Earache	407	75.4
Cervical lymphadenopathy	310	57.4
Cough	208	38.5
Dysphagia	225	41.7

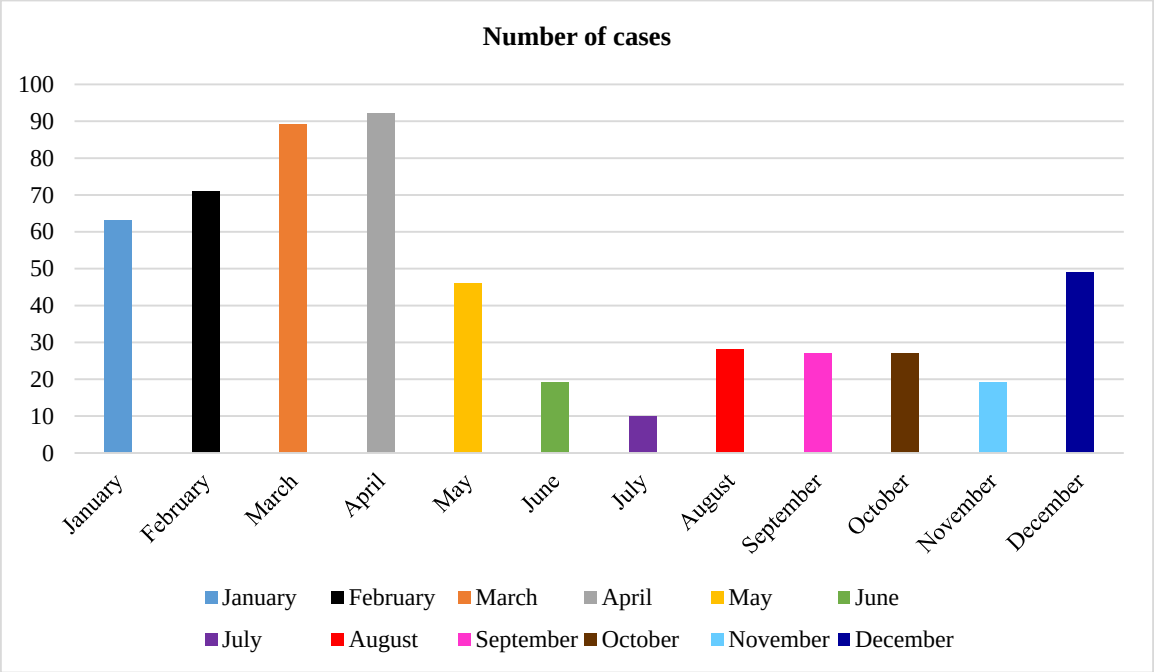

Figure 2: Month wise distribution of cases.

The most common clinical presentation among study subjects was fever (91.1%) and parotid swelling (100%). Initial presentation was unilateral parotid swelling in almost 72% of study subjects which progressed to bilateral parotid swelling. Around 92.2% of study population had bilateral swelling of parotid gland. Almost 75.4% of study subjects had earache and 57.4% of them had cervical lymphadenopathy. In about 38.5% of study subjects cough was also found and around 41.7% had difficulty in opening the mouth and swallowing the food. The mean duration of parotid gland swelling was 8 days.

Table 5: Distribution of study population according to complications.

Complications	Number	%
None	504	93.3
Suppuration of parotid gland	25	4.7
Meningitis	5	0.9
Orchitis	6	1.1
Total	540	100

In the present study almost 93.3% of study population did not have any complications. Around 4.7% of the study subjects developed suppuration of parotid gland and 1.1% of them developed orchitis and around 0.9% of them had aseptic meningitis. The cure rate was found to be 91.7% of study subjects and 8.3% of study subjects left against medical advice. There was no fatality reported among the study subjects.

Table 6: Relationship between complications and age.

Complications	0-10 years (%)	>10 years (%)	Total (%)
Present	9 (25)	27 (75)	36 (100)
Absent	354 (70.2)	150 (29.8)	504 (100)
Total	363 (67.2)	177 (37.3)	540 (100)

Using chi square test of significance, chi square –31.21, $p<0.0001$.

In the present study it was found that the complications were higher among >10 years of age group (75%) and study subjects <10 years of age had very less rate of complications (25%). The difference was found to be statistically highly significant ($p<0.0001$).

Table 7: Relationship between complications and gender.

Complications	Males (%)	Females (%)	Total (%)
Present	11(30.6)	25 (69.4)	36 (100)
Absent	280 (55.6)	224 (44.4)	504 (100)
Total	291 (53.9)	249 (46.1)	540 (100)

Using chi square test of significance, chi square – 8.4, $p<0.05$.

In the present study, it was found that around 69.4% of complications were among females and 30.6% of complications were among males. The difference was found to be statistically significant ($p<0.05$).

DISCUSSION

In the present study it was found that maximum incidence of disease (35.9%) was found in the age group of 6-10 years and around 31.3% was found in the age group of 0-5 years. The present study findings were comparable to a study conducted in slums of Kolkata where 39.4% of cases were found in the age group of 6-10 years and 32.69% were in the age group of 0-5 years.[8] These findings were also similar to a study by Geeta et al and Ghatage et al.[9,10]

In the present study, the disease was found to be higher among Males (53.9%) as compared to females (46.1%). The findings were similar to a study conducted by Raut et al where higher preponderance was found among females as compared to males.[11]

The difference of disease burden in the age group of 0-10 years and >10 years among males and females was found to be statistically highly significant ($p<0.0001$). The present study findings were similar to a study conducted by Indranil et al.[8]

In the present study it was found that mumps was higher among Muslims (58.3%) followed by Hindus (31.9%) and was least among Christians (9.8%). These findings differed to a study conducted in Kolkata where higher burden of disease was found among Hindus (77.9%).[8]

The present study findings with relation to month/season wise distribution of cases was similar to a study conducted by Li et al where maximum incidence of cases was found in spring season followed by Winter months.[12] The clinical findings of fever with parotid gland swelling was similar to a study conducted by Zamir et al where parotid gland swelling was found in 94.4% of cases and fever was found in 55% of cases.[13] The same findings were also found in a study conducted by Martina et al.[14]

The average duration of parotid gland swelling was 8 days in present study and this finding was comparable to a study conducted by Indranil et al where mean duration of swelling was 6.91±1.95 days.[8]

The study findings with respect to complications like orchitis and meningitis are comparable to a study conducted by Zamir et al and Yung et al.[13,15]

CONCLUSION

Mumps though a non-fatal and self-limiting illness, has the potency to cause epidemics and is not an innocuous disease. Vaccination is the best way to prevent mumps. Mumps vaccines (live attenuated vaccine) are available as a monovalent vaccine, a bivalent measles-mumps vaccine, or as a trivalent measles-mumps-rubella vaccine (MMR) and measles-mumps-rubella-varicella (MMRV) vaccines. The goal should be to achieve >90% immunization coverage so as to avoid subclinical cases and further circulation of mumps virus in the environment.

There is a need to identify MMR vaccine as routine vaccine in the national immunization schedule at 9 months of age with 2 boosters at 15-16 months of age and 4-6 years of age to prevent the outbreaks of mumps in the country.

Limitations

No laboratory confirmation of the mumps disease was done. Only clinical criteria was used to diagnose the disease as Mumps/ viral parotitis. As it's a hospital based retrospective study, subjects who left against medical advice could not be retrieved with regards to their outcomes and all the findings of this study cannot be generalized to community.

ACKNOWLEDGMENTS

The authors are grateful to the Principal of Gandhi Medical College and Superintendent of Govt. Fever Hospital/ Sir Ronald Ross Institute of Tropical and Communicable Diseases for providing an opportunity to carry out the study. The authors are thankful to the records section in charge for her cooperation and support in carrying out this study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee of Gandhi Medical College

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Cite this article as: Ivaturi PB, Asma. A study on profile of patients with parotid swellings attending infectious disease hospital, Hyderabad, Telangana. Int J Otorhinolaryngol Head Neck Surg 2018;4:770-5.