

AN EPIDEMIOLOGY BASED INPATIENT DATA ANALYSIS AT AN INFECTIOUS DISEASE HOSPITALMeera Rao¹, V. Sudha Rani², Taruni³, Shankar⁴**HOW TO CITE THIS ARTICLE:**

Meera Rao, V. Sudha Rani, Taruni, Shankar. "An Epidemiology Based Inpatient Data Analysis at an Infectious Disease Hospital". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 33, April 23; Page: 5643-5651, DOI: 10.14260/jemds/2015/826

ABSTRACT: INTRODUCTION: Communicable diseases continue to be the leading cause of considerable mortality & morbidity in our country. At the hospital where the study was done, patients with febrile illnesses from various parts of the state are admitted for infectious diseases which include Viral fevers, acute diarrheal diseases (ADD) , Enteric fever, Cholera, Infectious hepatitis, Malaria, Dengue, Chikungunya, Measles, Mumps, Chicken pox, Diphtheria, Tetanus, Dog bites & Rabies. **CONTEXT:** Patients attending outpatient department (OPD) of an infectious disease hospital with febrile illnesses. **AIM OF THE STUDY:** The aim of the study was to determine the prevalence of various communicable diseases among patients attending the OPD of the hospital, the rate of admission with provisional diagnosis and patient outcome in relation to the disease. **MATERIAL & METHODS:** Patients who attended the OPD from September 2012 till August 2013 were included in the study. Clinical and personal data was documented for each patient. Laboratory investigations were done as guided by clinical presentation. All patients with moderate to severe morbidity & serious illnesses were admitted. **RESULT OF THE STUDY:** The study showed that while the incidence of infective illnesses like acute diarrhea, malaria, dengue & clinical diphtheria is high, tetanus and rabies cases are not uncommon.

KEYWORDS: communicable diseases, outpatient, inpatient, infectious disease, ADD, provisional diagnosis.

INTRODUCTION: It is a known fact worldwide that all infectious diseases are preventable. But even after decades of development of interventional strategies, most developing and under developed countries continue to suffer from communicable diseases leading to considerable morbidity, mortality & economic burden. This is of grave concern since some of these diseases can lead to outbreaks involving wide geographic regions and sometimes to pandemics with diseases like cholera. Hence, there is a need to analyze from time to time, the locally existing current prevalence and epidemiological factors leading to the spread of infectious diseases.

AIM OF THE STUDY: to assess the prevalence of communicable diseases in patients attending OPD, the associated morbidity leading to admission of the patients, the average duration of their inpatient stay followed by patient outcome i. e. treated & discharged, referred to other centers based on complications or death.

MATERIALS AND METHODS: All patients attending the OPD over a period of one year from 1-09-2012 to 31-08-2013 were included in the study. Personal data, results of preliminary investigations which included CBP, ESR, PC, CUE, and Widal test and provisional diagnosis of each patient were noted. Appropriate treatment based on clinical diagnosis initiated on the first day pending laboratory results.

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INCLUSION CRITERIA: All patients with fever.

Age wise, patients were grouped into three categories for statistical purpose-<12 yrs, 12-60 yrs and >60 yrs (Table 1).

RESULTS: From September 2012 –August 2013, number of patients attending OPD were 1, 94, 826. Of these, 1,88,391 (96%) were males & 6,435 (4%) were females. Total number of patients admitted were 10,496. Out of these 2015 (19.19%) were below 12 yrs, 1149(10.9%) males and 866(8.2%) females. 7969(76%), were in 12-60 age group out of which 4175(39.7%) were males and 3794(36.4%) were females, while 512(4.8%) were in >60 yrs age out of which 286(2.7%) were males and 226(2.1%) were females. The diagnosis of each disease was confirmed based on laboratory investigations that included general and specific tests which were done as per standard laboratory procedures and based on which patients were categorized into different infectious diseases. (Figure 1).

Viral Fevers: Total cases 4818(46.08%), 413(56%) males, 324(43.9%) females under 12 yrs, 2124(54.1%) males, 1800(55.9%) females 12-60 yr, 107(68.1%) males, 50(31.9%) females above 60 yrs. Maximum cases- 776(16.1%) in September. No deaths.

ADD: Total number of cases admitted was 2354(22.4%), 73(3.10%) were below 12 yrs, 40(54.7%) males, 33(45.3%) females. 895(44.7%) males and 1104(55.3%) females among 1999(84.9%) cases in 12-60 yrs age group, 138(47.9%) males were above 60 yrs while 144(52.1%) were females. Maximum numbers of cases in July 259(11%). 17(0.72%) cases died- 4 were below 12yrs, 13 above 60 yrs.

Malaria: Out of 760(7.22%), 68(68.6%) males, 31(31.4%) females under 12 yrs, 374(58.8%) males, 262(41.2%) females 12-60 yrs, 15(60%) males, 10(40%) females above 60 yrs. Maximum cases- 115 (15.1%) occurred in January. Plasmodium vivax was seen in 700(92%) & P. falciparum in 60(8%). No deaths.

Enteric Fever: Total no. of cases-560(5.32%), 47 (51%) males and 45 (49%) females under 12 yrs, 218 (48.7%) males and 229 (51.3%) females between 12 and 60 yrs, 10 (47.6%) males and 11 (52.4%) females above 60 yrs. Maximum cases (79-14.1%) in September. No deaths.

Mumps: Total admissions 439 (4.17%), 170 (55.7%) males and 135 (44.3%) females under 12 yrs 305 (69.4%), 60 (45.1%) males and 73 (54.9%) females between 12-60 yrs 133(30.2%). Maximum cases in March 67(15.2%). 1(0.22%) patient died.

Diphtheria: 383(3.64%) admissions, 157(40.9%) were below 12 yrs, 95(60%) males, 62(40%) females. 99(43.8%) males and 127(56.2%) females, total 226(59.1%) in 12-60 yrs age group while there were no cases in above 60 yrs age. Maximum cases 55(14.3%) in November. 21(5.48%) patients died.

Measles: Out of 332(3.16%), 175(57.56%) males and 129(42.44%) females were below 12 yrs, total 304(91.56%), 17(60.7%) males and 11(39.28%) females were in 12-60 age group, total 28(8.44%). Maximum cases in April (were) 79(23.7%). No deaths.

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Chicken pox 295(2.8%) admissions, 66(49.23%) males and 64(50.3%) females in <12 yrs age group, total 130(44%), 165(55.9%), 106(64.2%) males and 59(35.7%) females in 12-60 yrs group. Maximum number of cases in March(67-22%), 2(0.6%) died.

Those treated for AVH(Acute viral hepatitis) were 255(2.42%) out of whom 34(13.3%) were below 12 yrs, 13(38.2%) males and 21(61.7%) females, 212(83.1%) were between 12 & 60, 163(76.8%) were males and 49(23.1%) were females, the rest(3.52%) were above 60, 7(77.7%) males & 2(22.2%) females. Maximum cases in June 41(16%). No deaths.

Dog Bite: 70(0.67%) cases of dogbite-21(72.4%) males and 8(27.6%) females below 12 yrs, 29(41.4%), 26(72.2%) males and 10(27.8%) females in 12-60 age group 36(51.42%), 4(80%) males and 1(80%) female aged above 60 yrs 5(7%). Maximum number of cases was admitted in October 21(30%).

Dengue Fever: Total number of cases 129(1.25%) 68(52.7%) males, 61(47.3%) females, 13(65%) males and 7(35%) females below 12 yrs 20(15.5%), 54(50.9%) males and 52(49.1%) females between 12 & 60 yrs total 106(82.17%), 1(33.3%) male and females 2(66.6%) were above 60yrs(2.3%)(Total 3). Maximum number of cases was admitted in September 49(37.98%). 2(1.5%) deaths.

Cholera: Total cases 31(0.29%), while there were no cases below 12 yrs, 25(80.6%) -11(44%) males and 14(56%) females were in 12-60 yrs age group and 3(50%) each 6-(19.3%) gender wise in above 60 yrs age group out of 31(0.29%) total cases. Maximum cases 11(35.48%) in July. No mortality.

Tetanus: Total number of admissions-49(0.46%) Below 12 yrs-13(72.2%) males, 5(27.8%) females total 18(36.73%), in 12-60 age group total 17(34.69%), 16(94.1%) males, 1(5.9%) female and above 60 yrs 1 female. Maximum number of cases 6(12.2%) in September.13 deaths (26.53%) occurred.

Rabies: 25(0.24%) total admissions-19(76%) males, 6(24%) females.8((88.8%) males and 1(11.1%) female below 12 yrs, 10(76.9%) males and 3(23.1%) females in 12-60 yrs, total 13(52%), 1(33.3%) male and 2(66.6%) females aged above 60 yrs total 3(12%). Maximum number of cases occurred in Nov 5(20%).

Whooping Cough: 10(0.1%) cases admitted. 7(87.5%) were males, 1(12.5%) female below 12 yrs 8(80%) and 2(20%) male patients in 12-60 yrs group. Maximum no of cases in Nov 3(30%) No deaths.

DISCUSSION: With ADD, Malaria, Tuberculosis & HIV topping the list across the globe, infectious diseases continue to be the major causes of morbidity and mortality. In the present study, maximum number of cases of infectious fevers admitted were treated as viral fevers (46.1%). The diagnosis and management of viral fevers was based more on the clinical presentation - history of fever with severe muscle and joint pains sometimes associated with skin rash and lymph gland swellings. Laboratory investigations- TC, DC & ESR were undertaken to rule out other bacterial infection. Most patients recovered & discharged in 48-72 hrs with antipyretics, bed rest and adequate IV fluids.^[1]

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Disease	<12Year Male	<12 Year Female	12 to 60 Male	12 to 60 Female	>60 Year Male	>60 Year Female	Total	Deaths
Acute Viral Hepatitis	13	21	163	49	7	2	255	0
ADD	40	33	895	1104	138	144	2354	17
Chickenpox	66	64	106	59	0	0	295	2
Cholera	0	0	11	14	3	3	31	0
Diphtheria	95	62	99	127	0	0	383	21
Measles	175	129	17	11	0	0	332	0
Mumps	170	135	60	73	0	0	438	1
Tetanus	13	5	16	1	0	1	36	13
Whooping cough	7	1	2	0	0	0	10	0
Rabies	8	1	10	3	1	2	25	25
Dengue Fever	13	7	54	52	1	2	129	2
Enteric Fever	47	45	218	229	10	11	560	0
Viral Fever	413	324	2124	1800	107	50	4818	0
Malaria	68	31	374	262	15	10	760	0
Dog bite	21	8	26	10	4	1	70	0

TABLE NO. 1: SHOWING AGE & GENDER WISE DISTRIBUTION OF INFECTIOUS DISEASES FROM SEP 2012 TO AUG 2013

ADD was the second common condition (22.4%). It is recognized that acute diarrhea is a major cause of childhood mortality in developing countries, however, adult mortality from diarrhea is also not uncommon, particularly among the elderly, in whom the case-fatality ratio is even higher than in children.^[2] In the present study, most of the cases (84.7%) occurred in 12-60yrs., during early rainy season in the month of July and had mild to moderate dehydration & recovered with fluid therapy and antibiotics. Death occurred in 17(0.7%) cases, due to severe dehydration and electrolyte imbalance in 15 children aged 8-10yrs. "Cardiogenic shock" was the cause of death in 2 elderly patients.^[3]

The third common infection in the present study was Malaria (7.2%) with maximum incidence in 12-60yrs age group and during peak rains, in the month of September. *P. vivax* was seen in 92% of cases and *P. falciparum* in 8%. Historically, *P. vivax* has been the major infecting species; however, over the past several years *P. vivax* cases have decreased: the ratio of *P. falciparum* versus *P. vivax* malaria was 0.41 in 1985, gradually increasing to 0.60 by 1995, and shifting to 1.01 by 2010.^[4] *Vivax* malaria was treated with parenteral Falcigo, Primaquine, antipyretics & IV fluids. *Falciparum* malaria patients were given Emal injections along with antipyretics. All cases recovered without any complications.

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Outbreak reports from India indicate that enteric fever is a major public health problem in our country.^[5] Enteric fever was found to be the fourth common infectious disease (5.3%) in the present study. Diagnosis was mostly clinical and all cases recovered with IV Monocef and paracetamol in addition to IV fluids.

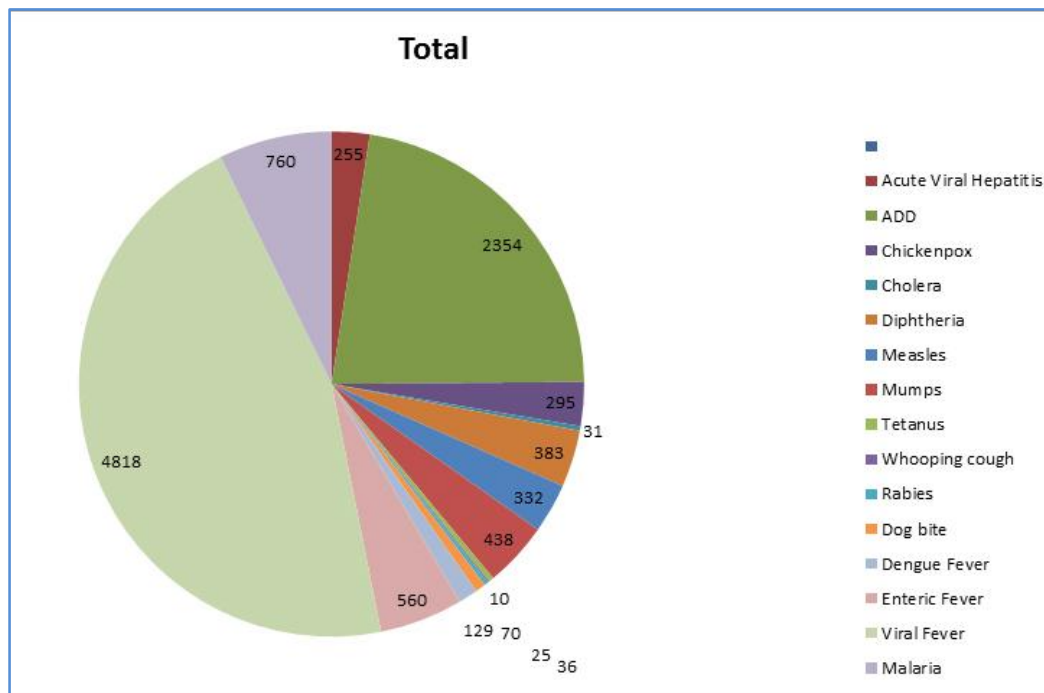


Figure 1: Showing prevalence of Different Infectious Diseases

The epidemiological aspects of mumps in India and the magnitude of the problem are not fully appreciated.^[6] Outbreaks occur at interval of 5-10 yrs.^[7] The IAP has recommended inclusion of MMR vaccine in the immunization schedule.^[8,9] Mumps ranks fifth in the sequence affecting 4.2% of patients in the present study. While most affected were less than 12 years (69%) 31% of cases were between 15 and 25 yrs. Males were more affected (56%) less than 12 yrs and females (54%) in 12-60 age group. 245(56%) patients gave history of receiving MMR vaccine at 15-18 months. The clinical features included fever greater than or equal to 39°C (90%), vomiting (90%), headache (70%), unilateral parotitis (50%), bilateral parotitis (50%) & maculopapular rash (20%). All patients recovered with no complications

Clinical Diphtheria: The incidence of diphtheria is high in India, especially in the state of Andhra Pradesh. Several factors contributing to morbidity and mortality include patient's immunization status, age at infection, time of infection, clinical type, and time of intervention.^[10] 383 clinical diphtheria cases (3.64%) admitted were of the nasopharyngeal type (100%) and presented with mild to moderate fever, sore throat, and a pseudo membrane on examination (100%). Additional presenting features included malaise, throat pain, dysphagia, cough, rhinitis, vomiting, abdominal pain, chest pain, palpitations & dyspnea. The clinical illness and outcome varied in different age groups. The most common age group affected was 5-20 years. Adults were more commonly affected

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(57.2%) than children (42.8%). Sixty percent of the affected were females as shown by other studies.^[11,12, and 13] The disease was seen most commonly in the months of October, December, January, and March. Myocarditis was observed to be the most common complication. Deaths occurred most commonly in the younger age group and in the non-immunized. Recovery was faster and the course of illness uncomplicated in the older age group and in completely immunized individuals.

In the year 2011, Measles outbreaks were reported in Ethiopia (3255 cases), France (14 949 cases), Italy (5189 cases), Nigeria (18 843 cases), Pakistan (4386 cases), Spain (3802 cases) and India (29 339 cases).^[14] The outbreaks indicate the need for effective immunization and the risks associated with not vaccinating children. 326 (3.09%) patients with fever and measles-like rash, cough, conjunctivitis, coryza, with or without Koplik's spots were admitted as Measles cases. Most of the patients (91.4%) were male children in 5-10 yrs age group, which is similar to that noted by Vivancos, Keenan, S Farmer, et al.^[15] Maximum number of cases (111) were admitted from January to May. While most (309) recovered without any complications, 17 patients aged less than 12yrs who developed pneumonia were treated with antibiotics and bronchodilators in addition to antipyretics, bed rest & IV fluids.

The incidence of Varicella in temperate climates is highest in children aged 1-9 years old.^[16] By contrast, in tropical countries like India, the incidence of Varicella is higher in adults^[17,18] as is also observed in the present study. Seasonality was observed with peaks occurring during late winter or spring.^[19] The present study noted slightly higher mortality rate in the older age group.

Of the 255 viral hepatitis cases, HAV (26.96%) was identified as the most common cause of acute hepatitis followed by HEV (17.97%), HBV (16.10%) and HCV (11.98%). Co-infections with more than one virus were present in 27% of cases; HAV-HEV co-infection being the most common. All cases recovered with no complications. An indication towards epidemiological shift of AVH from children (34) to adults with (212) male preponderance was seen. Similar observations were made by P. Jain et al.^[20]

During the last 50 years a large number of physicians have treated and described dengue disease in India.^[21] 131 laboratory (IgM-ELISA) confirmed cases of dengue fever were treated at Sir Ronald Ross Institute of Tropical & Communicable Diseases (SRRIT&CD) from August 2012 to September 2013. Most were in 12-60yrs age group with peak incidence in 8-21year old. Maximum (93%) of cases were admitted during the months of September, October & November 2012. Management was mainly symptomatic and fluid replacement. All patients recovered.

The global incidence of tetanus is about 18 cases per 1000 population per year, with case fatality between 20 and 50% especially in the elderly and neonatal population.^[22] Although the incidence of tetanus is grossly under reported in India, it has shown a downward trend due to the national immunization programme.^[23]

Out of 29 cases of tetanus admitted at SRRIT&CD 16 cases gave history of primary vaccination and no booster dose. 12 were around 10 yrs old and 4 above 20. All 16 cases recovered with isolation, bed rest, IVIG, IV fluids, sedatives and antibiotics. Inpatient stay was 10 days. 13 patients, below 12 yrs-3, around 20 yrs 2 and above 40 yrs-5 and 5 patients above 60 yrs died within 48 hrs of admission. These patients were not vaccinated. The higher risk in elderly is possibly related to a decline in protective levels of antibodies with ageing.

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It is a known fact that Rabies is a deadly disease with no cure affecting 30,000–50,000 human cases per year in India leading to 36% of the world's rabies deaths.^[24]

25 cases of rabies were admitted, all with a history of stray dog bite, maximum cases 13 in 20- 25 yrs age group with 5-20 days as the average incubation period. All died, average death time being 7-10 days.

All 71 dog bite cases were treated with local wound management, ARV, RIG and antibiotics. None developed Rabies.

The number of cholera cases and deaths due to cholera has steadily declined, mainly due to improvements in sanitation and water hygiene. South-east Asia including India and Bangladesh continue to be the regions where cholera is still continue to be the regions where cholera is still a major health threat, not as a regular occurrence but occur as outbreaks, especially during the summer season.^[25] The outbreaks are almost always due to overcrowding of people living in poor conditions and with lack of access to clean drinking water. All 31 cholera patients admitted at SRRIT&CD responded to Doxycycline and IV fluids.

The World Health Organization (WHO) estimates there were 40 million cases of pertussis in 1994 and 360,000 deaths. WHO believes only one to two per cent of cases are reported. In industrialised countries four children out of every 10,000 infected die from pertussis and its complications. In Australia the first pertussis vaccine was manufactured in the 1920s. There is a clear seasonal pattern with 65% of notifications occurring over the spring and summer months. ^[26]

10 cases of suspected whooping cough that were admitted recovered in 3-5 days with no complications with antibiotics and antitussives.

CONCLUSIONS: Vaccine preventable infectious diseases continue to be the cause for concern regarding implementation of complete immunization schedules both in humans and in animals, especially, dogs. Political will to ensure safe public drinking water and sanitized food supply is to be emphasized. Vector control measures are to be implemented routinely and effectively. Health awareness, especially regarding immunization, personal hygiene and food, water and environmental sanitation among general population needs to be strengthened.

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