ORIGINAL RESEARCH ARTICLE

ISSN - Print: 2277 – 1522, Online: 2277 - 3517

Study of Notifiable Infectious Diseases Reported to a Tertiary Care Hospital in Kancheepuram District of Tamil Nadu

Dr.R.Revathi [1] Dr.S.Gopalakrishnan[2]

Date of Submission: 25.10.2013 Date of Acceptance: 12.01..2014

ABSTRACT

Background: The range and burden of infectious diseases in India are enormous and they still contribute about 30% of the disease burden. Notification is an important source of epidemiological information which enables early detection of disease outbreaks which helps to take immediate action to control its spread. The objective of this study was to describe the pattern of notifiable diseases reported to the tertiary care hospital in Kancheepuram district in Tamil Nadu between 2009 and 2012. **Materials & Methods:** This was a hospital record based retrospective study. The data collected was analyzed and the results were tabulated in the tabular form applying descriptive statistics. **Results:** Male patients constituted 59.31% and female patients were 40.69 %. Age group wise distribution of the patients shows that 25.1% were under the age of 12 years, 63.6% were in the age group of 13-59 years and 11.3% were in the age group of 60 years and above. Out of the 12 conditions diagnosed and treated in this hospital the most frequently reported were patients with typhoid fever (22.8%), tuberculosis (21.4%) and Dengue fever (20.4%). This was followed by patients with Chicken pox (8%), influenza (6.3%) and Acute Diarrheal Disease (6.2%). Males were predominantly affected by most of the commonly occurring diseases like tuberculosis, typhoid fever, dengue fever and chickenpox. Less frequently reported were Viral Encephalitis (0.8%), AIDS (0.7%), Measles (0.5%) and Hepatitis (0.3%). **Conclusion:** Majority of notifiable infectious diseases were reported among adults who are in the economically productive age group followed by children. More males were found to be reporting for treatment when compared to females. Dengue, chicken pox, typhoid and tuberculosis were reported most frequently when compared to other diseases. Strengthening of existing public health activities should be undertaken to prevent the occurrence of the notifiable diseases.

Key Words: notifiable diseases, infectious diseases, surveillance, prevention

Introduction

In India, the range and burden of infectious diseases are enormous. Although the burden of infectious diseases has decreased as a result of overall socioeconomic progress and increasing use of vaccines and antimicrobials, they still contribute about 30% of the disease burden in India.[1] The prevention, management, and control of communicable diseases require active participation and cooperation of health care professionals and the public. There is an inbuilt surveillance system in our Public Health administration which requires that when diagnosis of an infectious disease is made or suspected it should be notified to the local health authority whose responsibility is to put into operation necessary preventive and control measures and further follow up action.

Post Graduate Student, Department of Community Medicine, SRM Medical College Hospital and Research Centre, Kancheepuram 603203, Professor, Department of Community Medicine, Sree Balaji Medical College and Hospital, Chennai-600044

Corresponding Author:

Dr.S.Gopalakrishnan, Professor, Department of Community Medicine,, Sree Balaji Medical College and Hospital, Chennai-600044. Email: drsgopal@gmail.com

Notifiable diseases are considered to be serious public health menace. The diseases to be notified vary from country to country and even within the country. Notifiable diseases may also include non-communicable diseases as well. Notification is an important source of epidemiological information which enables early detection of disease outbreaks which helps to take immediate action to control its spread. Notification also provides valuable information about fluctuations in disease frequency and provides early warning about new occurrences and outbreaks. Notification of the infectious disease is often made by the attending physicians and the hospital authorities. [2] The Public Health Notifiable Disease Management Guidelines were developed by the State Health authorities with input and advice from Medical Officers of Health, Public Health Professionals and Infectious disease specialists. The Notifiable Disease guidelines outline the recommended practices for the follow-up of selected Notifiable diseases and are intended for use by public health professionals in the State.

The existing disease surveillance and notification system in India was introduced a century back, but revised, over time, with the emergence of frequently occurring epidemics such as Influenza, Cholera, SARS, H1NI etc. The country's' emphasis is on monitoring around 26 reportable infectious diseases. But this legal requirement has been a slow and labor intensive process that takes several weeks before epidemiologist receives aggregates of this handful of diseases for any kind of analysis. [3] There were limitations to the existing reporting system which have lead to human and economic losses during several previous outbreaks. For example, a 2009 outbreak of Chikungunya in the southern parts of Tamil Nadu went largely undetected due to inefficiencies and gaps in the existing public health reporting system.[4]

To overcome these difficulties, the Notification of infectious diseases has been integrated with the Government of India's Integrated Disease Surveillance Project (IDSP). IDSP is a decentralized, State-based surveillance program in the country, which is intended to detect early warning signals of impending outbreaks and help initiate an effective response in a timely manner.[5]

Thus a Notifiable disease is any disease that is required by law to be reported to Government Health Authorities. There are 22 Notifiable infectious diseases listed by the Tamil Nadu Directorate of Public Health. [6]

List of Notifiable Diseases

1	AIDSs	12	Influenza
2	Dengue fever	13	Measles
3	Chikungunya	14	Plague
4	Malaria	15	Small pox
5	Whooping cough (Pertusis)	16	Cholera
6	Rabies	17	Hepatitis
7	Tetanus	18	Leprosy
8	Viral encephalitis	19	Cerebrospinal fever
9	Chicken pox	20	Polio
10	Diphtheria	21	Scarlet fever
11	Tuberculosis	22	Typhoid fever

[Apart from this the nutritional deficiency disorders like Malnutrition, Anaemia, Vitamine A Deficiency and Iodine Deficiency is also included under the notifiable disease list.]

Based on this the collation of information about Notifiable infectious diseases occurring in the respective hospitals allows the authorities to monitor the disease occurrence and provides early warning of possible outbreaks. This is applicable to both the private hospitals and public hospitals like the primary, secondary and tertiary care hospitals in the State. Usually the tertiary care hospitals attached to medical colleges in the State receives a continuous stream of patients affected with the locally endemic infectious disease directly or by referral service.

With this background this study was planned to profile the Notifiable diseases reported in a tertiary care hospital, during the past years in order to identify any variations or patterns existing in the area. The main objective of this study was to describe the pattern of Notifiable diseases reported to the tertiary care hospital in Kancheepuram district in Tamil Nadu between 2009 and 2012.

Materials and Methods:

Study area and population covered: This study was carried out in a tertiary care hospital located in Kancheepuram District of Tamil Nadu. The hospital caters to nearly 250000 population spread over nearly 49 panchayaths around the hospital which forms the catchment area of its services. Apart from the permanent residents of the area, there are a sizeable number of students and migrant workers who are working in different occupations since this district is highly industrialized and a lot of construction activities are also going on. Even though, there are primary health centers, taluk hospitals and private hospitals in the vicinity, this hospital functions as a referral centre. So any patient who is suffering from any serious communicable diseases may come directly to this hospital or are been referred by medical practitioners in the catchment area.

Study design and data collection: This is a Hospital record based retrospective study. The secondary data was collected from the Notifiable Disease register maintained by the Medical Records Division of the hospital. The data was collected for 4 years from 2009 to 2012 and tabulated in a spreadsheet.

Data analysis: Basic demographic and morbidity details of the respondents such as age, sex, disease pattern etc were ascertained. Data was analyzed and the results were tabulated in the tabular form applying appropriate descriptive statistics.

Results:

Socio-demographic characteristics

A Total of 2622 patients with notifiable infectious diseases were reported during the period from 2009 to 2012. Year wise distribution of the patients reported shows that there were 93 (3.55%) in 2009, 702 (26.77%) in 2010, 801 (30.55%) in 2011 and 1026 (39.13%) in 2012.

Table-1: Year wise distribution of reported notifiable diseases

No	Year	Number	Percentage
1	2009	93	3.55
2	2010	702	26.77
3	2011	801	30.55
4	2012	1026	39.13
	Total	2622	100.00

[Table-1] Male patients constituted 1555 (59.31%) and female patients were 1067 (40.69 %). Age group wise distribution of the patients shows that 657 (25.1%) were under the age of 12 years, 1668 (63.6%) were in the age group of 13-59 years and 297 (11.3%) were in the age group of 60 years and above. [Table- 2 & 3]

Morbidity characteristics:

Out of the 22 notifiable infectious diseases, the hospital record showed that only 12 conditions were diagnosed and treated in this hospital. [Table-2 & 3]

Table-2: Sex wise distribution of Notifiable diseases

No	Notifiable Diseases Reported	Male No (%)	Female No (%)	Total No (%)
1	AIDs	13 (76.5)	4 (23.5)	17 (0.7)
2	Chicken pox	108 (51.4)	102 (48.6)	210 (8.0)
3	Dengue	327 (61.0)	209 (39.0)	536 (20.4)
4	Hepatitis	7 (87.5)	1 (12.5)	8 (0.3)
5	Influenza	96 (58.5)	68 (41.5)	164 (6.3)
6	Leprosy	40 (63.5)	23 (36.5)	63 (2.4)
7	Malaria	105 (39.3)	162 (60.7)	267 (10.2)
8	Measles	11 (78.6)	3 (21.4)	14 (0.5)
9	ADD/Cholera	97 (59.5)	66 (40.5)	163 (6.2)
10	Tuberculosis	404 (71.8)	158 (28.2)	562 (21.4)
11	Typhoid	335 56.0	263 44.0	598 22.8
12	Viral encephalitis	12 60.0	8 40.0	20 0.8
	Total	1555 59.31	1067 40.69	2622 100

Most frequently reported diseases were patients with typhoid fever: 598 (22.8%) followed by patients with tuberculosis: 562 (21.4%) and patients with Dengue fever: 536 (20.4%). This was followed by patients with Chicken pox 210 (8%), with influenza 164 (6.3%) and with Acute Diarrheal Disease 163 (6.2%) This formed the next major reported infectious diseases. Patients with clinical features of Leprosy constituted 63 (2.4%) patients. Less frequently

reported were Viral encephalitis 20 (0.8%), AIDS 17(0.7%), Measles 14 (0.5%), Hepatitis 8 (0.3%).

The sex wise distribution of notifiable infectious diseases reported to the hospital showed that males were predominantly affected by most of the commonly occurring diseases like tuberculosis, typhoid fever, dengue fever and chickenpox. Similarly the less commonly reported diseases like AIDS, Viral encephalitis, infective Hepatitis are also predominantly seen among males. May be this male predominance is due to the better treatment seeking behavior of the males when compared to the female patients. [Table 2]

Table -3: Age wise distribution of Notifiable diseases

No	Notifiable Diseases	<12yrs	13-59 yrs	>60 yrs	Total
		No (%)	No (%)	No (%)	No %
1	AIDS	0 (0)	16 (94.1)	1 (5.9)	17 (0.7)
2	Chicken pox	7 (3.3)	201 (95.7)	2 (1.0)	210 (8.0)
3	Dengue	76 (14.1)	419 (78.2)	41 (7.7)	536 (20.4)
4	Hepatitis	2 (25.0)	6 (75.0)	0 (0)	8 (0.3)
5	Influenza	46 (28.0)	70 (42.7)	48 (29.3)	164 (6.3)
6	Leprosy	1 (1.6)	44 (69.8)	18 (28.6)	63 (2.4)
7	Malaria	60 (22.5)	199 (74.5)	8 (3.0)	267 (10.2)
8	Measles	12 (85.7)	2 (14.3)	0 (0)	14 (0.5)
9	ADD/ Cholera	59 (36.2)	78 (47.9)	26 (15.9)	163 (6.2)
10	TB	25 (4.4)	402 (71.5)	135 (24.1)	562 (21.4)
11	Typhoid	366 (61.2)	217 (36.3)	15 (2.5)	598 (22.8)
12	Viral encephalitis	6 (30.0)	11 (55.0)	3 (15.0)	20 (0.8)
	Total	657 (25.1)	1668 (63.6)	297 (11.3)	2622 (99.86)

The age wise distribution of the patients shows that 63.6% of those affected were in the age group of 13 to 59 years age group while children less than 12 years contributed to the next group comprising about 25.1% while the elderly above 60 years contributed to only 11.3% of the reported patients. Measles and typhoid fever were seen more among the children less than 12 years age group, while chicken pox, dengue fever, influenza, leprosy, malaria, and tuberculosis were predominantly found in the age group of 13 to 59 years. Most of the elderly patients reported with history of tuberculosis, influenza and dengue fever. [Table 3]

Discussion

This study of notifiable infectious diseases reported to the tertiary care hospital in Kancheepuram district shows that most of those affected were in the adult age group followed by children and males were most commonly affected when compared to females. Dengue fever, typhoid fever and tuberculosis were the most commonly reported diseases followed by chicken pox, influenza, and malaria. The relatively high incidence of dengue and malaria may be due to the increasing presence of migrant laborers who are staying and working in a very unhygienic environment where mosquito breeding is rampant. The high level of industrialization and the related construction activities plus the presence of several professional educational institutions also contribute to this phenomenon. The incidence of vaccine preventable diseases is found to be relatively very low, which shows the success of the National Universal immunization programme.

Communicable diseases, like tuberculosis, malaria, kala-azar, dengue fever, chikungunya and other vector borne diseases, and water-borne diseases like cholera, diarrheal diseases, leptospirosis etc, continue to be a major public health problem in India. In fact, diarrheal diseases, respiratory infections, tuberculosis and malaria cause about one quarter of all deaths in the country. Well defined strategies have been identified to control communicable diseases. These *inter alia* include 1) risk reduction, 2) adequate health care infrastructure, 3) availability of adequately trained health manpower, 4) an efficient disease surveillance and response system for early detection and treatment of cases and for early detection and control of outbreaks of epidemic prone disease and 5) risk communication.[7]

The main objective of Integrated Disease Surveillance Project (IDSP) into which the notifiable

diseases reporting have been integrated, was meant for early detection of disease outbreaks. This could be possible only when the public health authorities have a strong and effective surveillance system in collaboration with Private Health Sector. An important component in this regard is strengthening hospital based disease surveillance for the priority diseases as identified by the project.[8]

Private Medical Practitioner's plays a crucial role in the health system where they serve nearly 70% of the population and are significant health care providers in many areas. Thus it is implied that the surveillance system will work efficiently only when private sector is taken into consideration. [9, 10] But the existing surveillance system had very little active involvement of private sector. Private Medical Practitioners could play a crucial role in disease surveillance and lead to early and timely response to impending epidemic. They could also help to generate the incidence rates for various diseases as they were the first contact point for majority of the populations.[11]

To sum up, under the current system in India the epidemiological departments monitor a subset of around 22 infectious diseases, termed as notifiable diseases. When a patient is diagnosed with a notifiable disease, at the point of care, the medical officer notifies regional health administrations or local authorities, using paper-based reporting methods, followed by a phone call in certain critical instances. Health Inspectors would, then, make house calls to investigate the individual cases and, if necessary, execute preventive procedures.

Conclusion:

This study shows that majority of the notifiable infectious diseases were reported among adults who are in the economically productive age group followed by children. More males were found to be reporting for treatment when compared to females. Dengue, chicken pox, typhoid and tuberculosis were reported most frequently when compared to other diseases. Strengthening of public health activities to prevent the occurrence of the notifiable diseases should be undertaken effectively so that it's repeated occurrence and threat can be reduced. The disease notification act should be implemented rigorously for all categories of medical and health personnel's in the country. As a part of this process they should be oriented to note down details of the patients especially suspected and probable cases designated under IDSP. The Health personnel's should be trained to report the presumptive as well as confirmed cases of diseases under surveillance promptly which will pave way for control of these dreaded public health menace in the near future.

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Source of Fund:Nil
Conflict of Interest: Nil