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SEASONAL VARIATION OF THE MORBIDITY PROFILE IN A TERTIARY CARE HOSPITAL IN CHANDIGARH

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ABSTRACT

Background: *Health though it is multidimensional in nature and difficult to measure but can be captured through a range of indicators i.e. mortality and morbidity. Having recognized the crucial importance of disease surveillance, the Government of India launched Integrated Disease Surveillance Project (IDSP) in November 2004 to detect and respond to disease outbreaks quickly for both communicable and non-communicable diseases.* ***Objectives****: (i) to find the magnitude and trend of communicable and non-communicable diseases being reported under IDSP, and (ii) to find out seasonal trends of the diseases.* ***Methodology****: A descriptive study done based upon secondary data available with Department of Community Medicine, Government*

Medical College & Hospital, Chandigarh for years (2014 to 2015) under IDSP. The data included the morbidity profile of patients visiting institution along with its associated rural and urban health centres. ***Results:*** *More than half (60%) of the morbidities reported were among males. Maximum morbidities were observed in rainy season followed by winter and then summer. Acute diarrhoeal disease (ADD) cases were reported significantly more during rainy seasons (40.4%) whereas ARI cases were significantly more in winter season (41.4%).* ***Conclusion:*** *In a well planned city i.e Chandigarh the burden of communicable diseases remains high in addition to the increasing trend of non-communicable diseases Hence, our focus should be to prevent and control infectious diseases and non-communicable diseases too.*

Key words: Surveillance, morbidities, seasonal variation, IDSP

INTRODUCTION

Health though it is multidimensional in nature and difficult to measure but can be captured through a range of indicators i.e. mortality and morbidity. The data on morbidity is easy to collect but difficult to measure without subjective bias.[1] A comprehensive analysis of the epidemiological pattern of the occurrence of various diseases in a region or a health care setting, in particular, equips the physicians with the necessary information to diagnose and treat them effectively and timely. It also provides an efficient tool to the policy makers and administrators for the formulation of policies to circumvent the effect of the morbidity and mortality due to these diseases as well as reduce the overall burden of the illness in the community.[2]

Many countries in the world have taken steps for the strengthening of the surveillance system for the communicable as well as non-communicable diseases which are slowly and steadily spreading their tentacles from the developed to the developing countries.[3]

Hippocrates mentioned the effects of seasons on health as early as 460–377 BC in his writings. The effect of environmental factors on various diseases has been a subject of concern over the years.[4]

Having recognized the crucial importance of disease surveillance for improving the health of the people, the Government of India launched National Surveillance Programme for Communicable Diseases (NSPCD) during 1997-98, with the main objectives of capacity building

at the state and district level for early identification followed by appropriate and timely response to outbreaks of communicable diseases.[5] Then Integrated Disease Surveillance Project (IDSP) was launched with World Bank assistance in November 2004 to detect and respond to disease outbreaks quickly for both communicable and non- communicable diseases.[6]

Studies pertaining to reporting of morbidity patterns reveals important facts which inform not only about the health status of various groups but also helps in identifying about type and extent prevalent morbidities, which provides vital feedback in setting priorities in health services reforms.[7] Keeping this in mind, this study was done in attempt to find out the morbidity patterns of diseases being reported under IDSP from the reporting units of a tertiary care institution in Chandigarh along with its two peripheral health centres i.e. Rural Health Training Centre (RHTC) and Urban Health Training Centre (UHTC) with the objectives to find the magnitude and trend of communicable and non- communicable diseases being reported under IDSP and to find the seasonal trends of the diseases.

MATERIAL AND METHODS

Study area and study design: Chandigarh is a modern, well planned city of Northern India with a population of around one million with 9,252 per sq. kilometre density.[7] It is largely urbanized with around 63% of the population residing in the urban area, 30% in slums and 7% in the rural area.

Excellent health indicators and a high literacy rate of 86.43%[7] are the highlighting features of this city. Government Medical College & Hospital (GMCH), Chandigarh is a tertiary care institution with more than 800 beds of different specialties. It caters for around 1.4 million outpatients, 60,000 inpatients and 65,000 emergencies per year.[8]

Department of Community Medicine is nodal agency for surveillance of various diseases under IDSP, in GMCH. A descriptive study was done based up on secondary data of IDSP available with Department of Community Medicine for the year 2014. Departments of General Medicine and Pediatrics along with their associated emergency departments, Department of Microbiology and health centres i.e. RHTC and UHTC under Department of Community Medicine were reporting the diseases on the weekly basis in the standardized format under IDSP.

The data was collected according to gender (separately for male and females) and age (below 15 years and 15 years and above). Seasonal variation of various diseases was seen over the year.

Statistical analysis: The data was entered in Microsoft Office Excel 2007. Statistical analysis was done with the help of Open Epi 2007. Descriptive statistical analysis was represented through frequency and percentages. Chi square test was used as test of significance.

tertiary care institution, and (ii) to find out seasonal variation of the diseases (if any).

RESULTS

Table 1: Distribution of morbidities according to Gender and Age (2014-2015)

	2014 N=26939 (%)	**2015 N=38492 (%)**	**TOTAL N=65431 (%)**
GENDER			
Males	15234 (56.5)	24012 (62.4)	39246 (60)
Females	11705 (43.5)	14480 (37.6)	26185 (40)
AGE (IN YEARS)			
> 15 years	15849 (58.8)	23385 (60.8)	39234 (60)
<15 years	11090 (41.2)	15107 (39.2)	26197 (40)

Total 65,431 morbidities were reported during two years study period under IDSP. Majority (60.0%) of the morbidities were reported among males. In table 1, increase in number of morbidities among males from year 2014 (56.5%) to 2015 (62.4%) was seen and proportionately a declining trend was seen among females from year 2014 (43.5%) to 2015 (37.6%). More than half (60.0%) of the morbidities were reported among persons more than 15 years of age . There was increase in number of morbidities reported among >15 years of age from year 2014 (58.8%) to 2015 (60.8%) and the declining trend was seen among children <15 years of age.

Among children (<15 years of age), it was observed that the leading cases were from communicable diseases viz. ARI (6350, 23.6%) followed by ADD (2290, 8.5%) in 2014 but among both diseases proportionately showed a declining trend, ARI (7626, 19.8%) and ADD (2509, 6.5%) in 2015. Among adults (>15 years), it was observed that during 2014 maximum cases of ARI (3667, 13.6%) were seen followed by RTA (3243, 12%), diabetes mellitus (2234, 8.3%) hypertension (2192, 8.1%). In 2015, an increase in RTA (6575, 17.1%) while communicable diseases like ARI showed a declining trend (3209, 8.3%).

Table 2: Distribution of overall morbidities according to Season (2014-2015)

SEASON	**2014 N=26939 (%)**	**2015 N=38492 (%)**	**TOTAL N=65431 (%)**
Winter	9642 (35.8)	12551 (32.6)	22193 (33.9)
Summer	8139 (30.2)	11471 (29.8)	19610 (30.0)
Rainy	9158 (34.0)	14470 (37.6)	23628 (36.1)
χ^2; p	0.84; 0.66	1.46; 0.48	0.84; 0.66

Table 2 shows year wise distribution of morbidities with respect to seasons. It was observed that maximum morbidities were reported in rainy season (23628, 36.1%). In 2014almost equal number of morbidities was observed in winter and rainy season followed by summer season while in 2015 maximum morbidities were observed rainy season followed by winter and then summer season. Among males, maximum cases of acute respiratory infection (ARI) were observed in year 2014(5425, 20.1%) but proportionately number of cases decreased in 2015 (6258, 16.3%). The number of road traffic accidents (RTA) were increased from 2400 (8.9%) to 5618 (14.6%). There was also increase in Fever of unknown origin (PUO) cases in 2015 (3996, 10.4%) in comparison to 2014 (1789, 6.6%).Among females, maximum number of cases of ARI was observed in 2014 (4592, 17.0%) followed by ADD (2043, 7.6%). A declining trend was observed in 2015 in ARI (4577, 11.9%) and ADD (2011, 5.2%) cases both while in PUO cases an increase was observed from 1157 cases (4.3%) in 2014to 2376 cases (6.2%) in 2015.

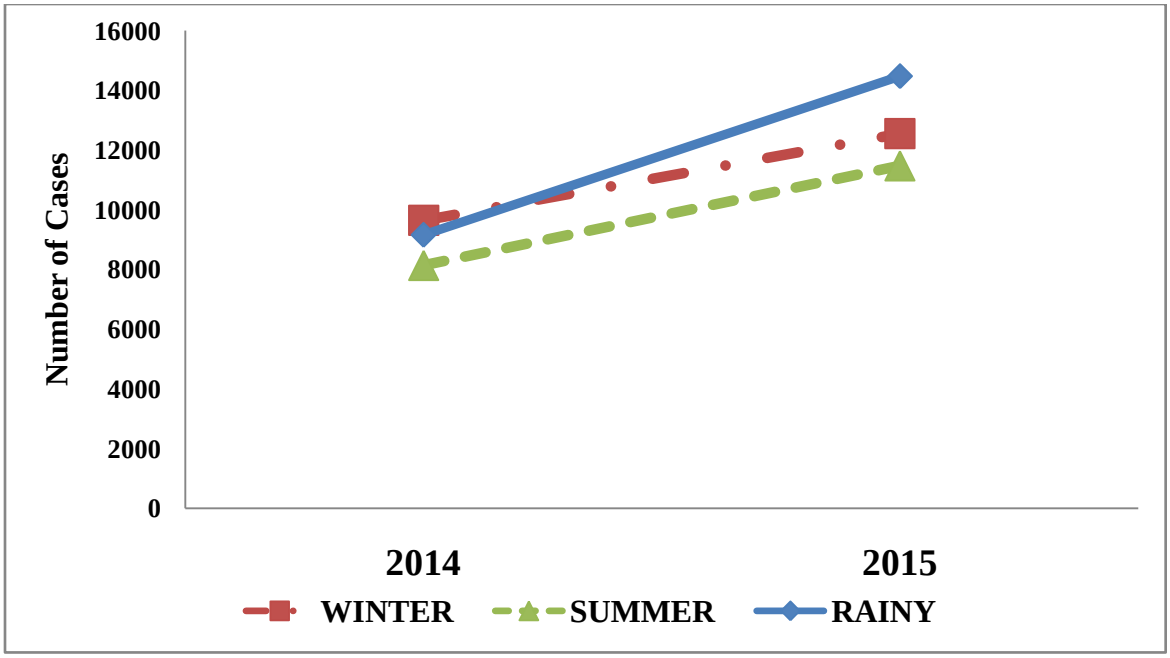

Fig.1: Time trend of morbidities according to Season (2014-2015)

An overall increasing trend in morbidities was observed during all three seasons from 2014 to 2015 but the increase was not found to be significant (p=0.66). Maximum cases were reported in winter season (9642) followed by rainy (9158) and then summer (8139) in 2014, whereas in 2015 maximum cases were observed in rainy (14470) followed by winter (12551) and then summer (11471) (Fig. 1).

Table 3: Distribution of top-six morbidities according to seasons (2014-2015)

Season	ARI N (%)	RTA N (%)	PUO N (%)	ADD N (%)	HTN N (%)	DM N (%)
Winter	8429 (40.4)	3627 (34.6)	2619 (28.1)	1993 (22.7)	1908 (35.1)	1722 (33.9)
Summer	6688 (32.1)	2898 (27.7)	1920 (20.6)	3155 (36.0)	1880 (34.6)	1631 (32.1)
Rainy	5735 (27.5)	3955 (37.7)	4779 (51.3)	3624 (41.3)	1649 (30.3)	1722 (33.9)
χ^2; p	3.36; 0.19	2.36;0.31	22.17;**0.00**	7.77;**0.02**	0.75;0.69	0.12;0.94

The overall seasonal variations of the top six morbidities during study period (2014-2015) are shown in Table 3. The seasonal variations for particular morbidities revealed maximum number of ARI cases occurred in winter seasons (40.4%) as compare to summer (32.1%) and rainy season (27.5%). RTA cases were maximum in rainy season (37.7%) followed by winter (34.6%) and least in summer (27.7%). PUO cases were highest in rainy season (51.3%) and least in summers (20.6%), and this difference was found to be **statistically significant (p=0.00).**ADD cases were reported more during rainy seasons (41.3%) as compare to summer and winter seasons (36.0% and 22.7%, respectively)and this difference was found to be **statistically significant (p=0.02)**.

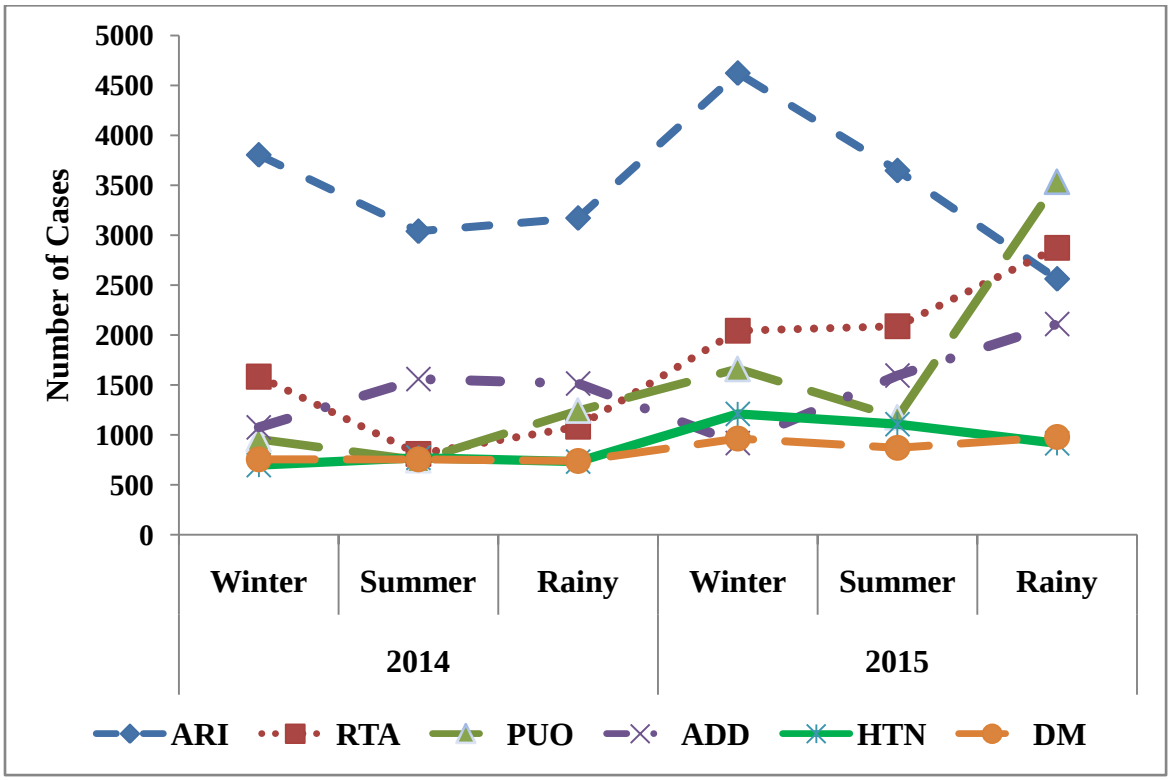

Fig.2: Distribution of top six morbidities in Chandigarh according to seasons during 2014-2015 (ARI= Acute Respiratory Infections, ADD= Acute Diarroheal diseases, RTA= Road Traffic Accidents, HTN= Hypertension, DM= Diabet

It was observed that maximum cases of ARI were seen throughout the two year period with peaks seen in winter in 2015 (42.6%)(Fig.2). Overall, ADD had shown an increasing trend from

2014 to 2015 with a drop in winter (19.8%) in 2015.PUO had shown alternate seasonal rise and fall trend with maximum cases inrainy season (57.0%) in 2015. Among non-communicable diseases,RTA had shown an increasing trend from 2014 to 2015 with peak in rainy season (41.0%) in 2015. Other NCDs i.e. hypertension and diabetes had shown a static trend with little increase in cases in 2015 as compared to 2014.

DISCUSSION

The results of present study indicate that Acute respiratory infection(ARI) , acute diarrhoeal diseases (ADD) and Fever of unknown origin (PUO) were most commonly diagnosed communicable diseases. Similar results were also obtained by Kansal S et al in Varanasi in which most common morbidity reported was ARI (18%) followed by PUO (15.4%) .Lagdir Gaikwad et al[9] observed that acute diarrhoeal diseases (39.3%) were commonly diagnosed followed by dengue fever (13%) in their study in Maharashtra wheresa Kumari R et al[3] at Kanpur found skin infections followed by acute respiratory disease as most common morbidities. The difference may be due to the varied climatic conditions of the regions where these studies were conducted.

In our study most common non communicable disease was road traffic accidents followed by hypertension and diabetes .These results are different from the study done in Kanpur district[3] in which chronic obstructive pulmonary disease (COPD) was the most common non-communicable disease followed by gastritis, falls/injuries and arthritis .In another study done in Pune[10] it was found musculoskeletal pains and hypertension as the most reported non-communicable diseases .

60% of the morbidities reported in the study were seen among males .This could be due to under reporting of morbidities in females. Also the data from Department of Obstetrics and Gynecology and Department of Skin and Venereal diseases is not reported under IDSP. It is similar to the findings of another study conducted in Chandigarh.[1] Yadav V[10] et al found that females outnumbered males in all the diseases except acute gastroenteritis (AGE) and Trauma in their study.

In the distribution of patients according to age, adults (>15 years of age) reported more morbidities as compared to <15 years age group . Yadav et al[10] also reported the similar findings in their study. Similar results were also seen in a study by Kansal S et al[11] in Uttar Pradesh.

The maximum burden of all the diseases in the present study was found in rainy season (36.1%), followed by winter season (33.9%). This is in agreement with the results of other studies done in Chandigarh[1] and Solapur[9] and Kanpur[3] where maximum burden of all the diseases was seen in monsoon. The favorable conditions during rainy seasons for the vector breeding, survival of the agent and increased agent, host and environment interaction makes it suitable for the occurrence of diseases.

The seasonal variations for particular morbidities revealed maximum number of ARI cases occurred in winter seasons (40.4%) as compare to summer (32.1%) and rainy season (27.5%). This finding was found to be statistically significant. Similar observations were also reported by Yadav v et al[10] in which there is increase in the number of cases suffering from URTI and Viral fever during winters, peaking in the month of Jan. ADD cases were reported more during rainy seasons as compare to summer and winter seasons which was also statistically significant. Our results are different from the study done by Manjula et al in kerela[12] where ADD were more during the summer . The reason for the observed upsurge of the diseases could be probably the transition phase of the season from summer to rainy which makes the adjustment of the host to the changed weather difficult, thus increasing his/her susceptibility.

Among non communicable diseases, RTA cases were maximum in rainy season (37.7%) followed by winter (34.6%) and least in summer (27.7%) whereas a study conducted at Pune[10] found that trauma cases were most commonly reported during months from Jan to Apr. The results of the present study can be attributed to poor visibility during rainy and winter season.

The high prevalence of communicable diseases conforms to the situation of a developing country where communicable diseases propagate in the environment milieu of malnutrition, poverty, infection, and other social factors. The relatively higher number of non-communicable diseases is an indication of the epidemiological transition and serves as an eye opener for the health planners to equip themselves against the diseases of the developed world. Studies from

developed nations reveal a prominence of non-communicable diseases such as hypertension, non-articular rheumatism, accidents, and mental disorders in their people.[13]

Further population based studies observed over a period of time are required that provide us a clearer picture about various communicable and non communicable diseases .Such data on the seasonality of the diseases would assist in the planning and implementation of control measures and better utilization of available resources .

By knowing the seasonal trends, the limited resources could be planned effectively by taking the preventive actions at the correct time for impending outbreak. Multi-centric study should be conducted to get a wider view of seasonal variation of morbidities. In addition to making policies for non communicable diseases, the efforts to control communicable diseases should continue.

LIMITATION

The results of present study are based on secondary data available with Department of Community Medicine, reported according to IDSP format. It includes 36 communicable and non-communicable diseases, and age is divided into two broad groups only, >15 years and <15 years of age only. The comprehensive age groups division (e.g. infant, under-five, adolescent, geriatrics etc.) will help in better classification of diseases. Cases from Department of Obstetrics and Gynecology or Department of Skin and Venereal diseases were not included.

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