MAGNITUDE AND TREND OF VARIOUS DISEASES AT A TERTIARY CARE INSTITUTION IN CHANDIGARH, NORTHERN INDIA.

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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 to a tertiary care institution, and (ii) to find out seasonal variation of the diseases (if any). Methodology: A descriptive study was done based on secondary data available with Department of Community Medicine, Government Medical College & Hospital, Chandigarh for five years (2009 to 2013) under IDSP. The data included the morbidity profile of patients visiting institution along with its associated rural and urban health centres. Descriptive statistical analysis was represented through frequency and percentages. Chi square test was used as test of significance. Seasonal variations and time trend over five years was calculated. Results: Total 1,36,888 morbidities were reported during study period under IDSP to the Department. More than half (61.06%) of the morbidities reported were among males. In 2009, maximum morbidities were observed in rainy season followed by winter and then summer and this difference was found to be statistically significant (p=0.00). Acute diarrhoeal disease (ADD) cases were reported significantly more during summer seasons (47.91%) as compare to winter and rainy seasons (20.47% and 31.62%, respectively) (p=0.00). Discussion and Conclusion: Though the increasing trend of non-communicable diseases has been observed but infectious diseases are still more prevalent even in a well-planned modern city i.e. Chandigarh. Hence, our focus should also be directed towards prevention and control of infectious diseases and non-communicable diseases too.

Key words: Surveillance, morbidities, seasonal variation, Chandigarh, India.

I. 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. 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. 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. Disease surveillance ought to be an important component of public health programme in every country. 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. 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 (i) to find the magnitude and trend of communicable and non-communicable diseases being reported to a tertiary care institution, and (ii) to find out seasonal variation of the diseases (if any).

II. MATERIAL AND METHODS
Study area and study design
The Union Territory of Chandigarh is a modern, well-planned city of Northern India with a population of around one million with 9,252 per sq. kilometre density. It is largely urbanized with around 63% of the population residing in the urban area, 30% in slums and 7% in the rural area. The city boasts of excellent health indicators and a high literacy rate of 86.43%. 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. It has a comprehensive emergency department, which also provides lifesaving medical services to patients.

Department of Community Medicine is nodal agency for surveillance of various diseases. Since under IDSP, in GMCH. A descriptive study was done based up on secondary data of IDSP available with Department of Community Medicine for five years (2009 to 2013).
Data Collection
The reports were provided weekly by the 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. But Department of Surgery provided reports monthly only. The standardized reporting format included a checklist of total 36 diseases (both communicable and non-communicable diseases) under IDSP. The data was collected according to gender (separately for male and females) and age (below 15 years and 15 years and above).

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. Seasonal variations and time trend over a five years was calculated.

III. RESULTS
Total 1,36,888 morbidities were reported during study period under IDSP to the Department. More than half (61.06%) of the morbidities were reported among males (Table 1). There was increase in number of morbidities among males from year 2009 to 2012 but proportionately a declining trend was seen from year 2009 (64.94%) to 2013 (59.48%), except for year 2012 (60.59%). Among females increase in morbidities was seen from year 2009 (35.06%) to 2013 (40.52%).

More than half (62.35%) of the morbidities were reported among persons more than 15 years of age (Table 1). There was increase in number of morbidities reported among >15 years of age from year 2009 till 2012 which further decreased in year 2013 but proportionately an increasing trend was observed from year 2009 (61.96%) to 2013 (66.27%). The declining trend was seen among children <15 years of age from year 2009 (38.04%) to 2013 (33.73%).

Among males, it was observed that maximum cases of acute respiratory infection (ARI) (27.34%) were observed in year 2009 followed by acute diarrhoeal disease (ADD) (23.92%) and road traffic accidents (RTA) (18.50%). Over the years ARI showed peak in 2010 (36.44%) and then decreasing trend was seen till 2013 (30.70%). Decreasing trend was observed for ADD from 2009 (23.92%) to 2013 (12.07%) while RTA had shown alternate rise and fall. Hypertension and diabetes showed a decreasing trend from 2009 (9.46% and 6.91%, respectively) to 2012 (6.60% and 5.64%, respectively) but rising trend was observed in 2013.

Among females, maximum number of cases of ARI was observed in 2009 (36.00%) followed by hypertension (17.14%) and ADD (15.41%). ARI showed peak rise in 2010 (44.78%) and thereafter declining trend was seen from 2010 to 2013 (36.42%). ADD showed increasing trend till 2011 and then decrease was observed from 2011 (18.36%) to 2013 (14.95%). Hypertension and diabetes showed a declining trend from 2009 (17.14% and 11.13%, respectively) to 2012 (9.16% and 7.72%, respectively) with slight increase in 2013 (9.73% and 8.89%, respectively). RTA showed alternate rise and fall with 7.48% cases in 2009 and 8.76% cases in 2013.

Among children (<15 years of age), it was observed that both the leading causes were communicable diseases viz. ARI with peak seen during 2010 (63.75%) followed by ADD which showed maximum cases in 2009 (33.45%). A declining trend was seen in ARI cases from 2010 to 2013 (57.33%). In year 2009, cases of pyrexia of unknown origin (PUO) (1.61%) were less in number but from 2010 onwards an increasing trend was observed with 8.95% cases of PUO were seen in 2013. It was followed by RTA showing alternate rise and fall. Among adults (>15 years), it was observed that during 2009 maximum cases of RTA (22.65%) were seen followed by hypertension (19.61%). RTA showed alternate rise and fall with a peak seen in 2013 (25.32%) while among hypertension a declining trend was observed after 2009 till 2013 (12.55%).

It was followed by ARI with peak seen during 2010 (24.90%) after which a decline was observed till 2012 (18.01%), but again in 2013 cases of ARI increased to 20.64%. Diabetes and ADD were initially more in number in 2009 (13.26% each) after which a declining trend was observed among both diseases till 2012 (10.54% and 9.98%, respectively) but diabetes cases were slightly increased in 2013 (11.25%).

Table 2 shows year wise distribution of morbidities with respect to seasons. It was observed that maximum morbidities were reported in rainy season (37.01%) from 2009 to 2013. In 2009, maximum morbidities were observed in rainy season followed by winter and then summer and the difference was found to be statistically significant (p=0.00) while in 2010 almost equal number of morbidities were observed in all three seasons (Fig. 1). Since 2010 to 2012 an increasing trend in morbidities was observed in all three seasons with maximum cases in rainy season followed by summers and then winter while a steep decline was observed in 2013 where least number of cases was seen in rainy (30.25%) and maximum morbidities observed in winter season (36.70%).

It was observed that maximum cases of ARI were seen throughout from 2009 to 2013 with peak during 2010 (39.70%) (Fig.2). It was followed by ADD, though a declining trend was observed from 2009 (20.94%) to 2013 (13.24%). RTA had shown alternate rise and fall trend while maximum cases were observed during 2013 (17.07%) as compared to 14.64% in 2009. Among non-communicable diseases hypertension and diabetes was observed showing a declining trend from 2009 (12.15% and 8.39%, respectively) to 2012 while again rise was observed in 2013 (8.37% and 7.48%, respectively).

The seasonal variations of the top five morbidities during study period (2009-2013) are shown in Fig. 2. During winters, ARI cases (40.86%) were reported mostly followed by RTA (15.49%) and ADD (10.19%). During summers, maximum of ARI cases (26.39%) were reported followed by ADD (23.81%) and RTA (15.25%). During rainy seasons, ARI cases (34.07%) were reported mostly followed by ADD (13.38%) and RTA (11.32%).

The seasonal variations for particular morbidities revealed maximum number of ARI cases occurred in winter seasons (38.05%) as compare to summer (24.62%) and rainy season (37.33%) (Table 3). ADD cases were reported significantly more during summer seasons (47.91%) as compare to winter and rainy seasons (20.47% and 31.62%, respectively) (p=0.00). The cases of RTA occurred more in winter and summer seasons (35.14% and 34.66%, respectively) than
The cases of hypertension were reported more during winter and summer seasons (35.14% and 35.73%, respectively) than rainy season (30.12%). The cases of diabetes mellitus occurred more during summer (37.06%) than winter and rainy seasons (31.47% each).

IV. DISCUSSION AND CONCLUSION

The results of the present study indicate that in a modern city like Chandigarh still communicable diseases are on rise with acute respiratory infection and acute diarrhoeal diseases reported as most commonly diagnosed diseases followed by non-communicable diseases like road traffic accidents, hypertension and diabetes. In a study conducted by Kumari R et al.7 at Kanpur district (Uttar Pradesh) in 2007-08 found skin infections followed by acute respiratory disease as most common morbidities. In our study most common non-communicable disease was road traffic accidents followed by hypertension and diabetes while a study done in Kanpur district reported chronic obstructive pulmonary disease (COPD) as most common non-communicable disease, followed by gastritis, falls/injuries and arthritis. In a study done by Kansal S et al.4 in Varanasi (Uttar Pradesh) found that most common morbidity reported was ARI (18%) followed by pyrexia of unknown origin (PUO) (15.4%), gastro-intestinal tract disease (11.4%), skin diseases (6.95%) and nutritional deficiency (6.8%). In a study done by John et al.15 in Kottayam District (Kerala) found most common disease to be acute dysentery followed by leptospirosis, typhoid fever and acute hepatitis.

In our study among males most common disease was found to be infectious diseases viz. ARI and ADD, followed by road traffic accidents. Among females, ARI was most commonly reported followed by hypertension and ADD. In a study done by Kumari R et al.7 in Kanpur district, most common morbidities found among males was avitaminosis (77.8%), COPD (37.5%), ARI (29.9%), falls/fractures/injuries (25.4%), dog bite (1.7%) while anaemia (55.8%), worm infestation (46.4%), gastritis (25%), arthritis (22.7%), reproductive tract infection (7.6%) among females were most common morbidities reported. If we see the distribution of patients according to age, adults (>15 years of age) reported more morbidities (62.35%) as compared to <15 years age group (37.65%). Similar findings were observed in a study by Kansal S et al.4 in Uttar Pradesh where consultation were more in adult age group of >45 years (67.8%) in comparison to other groups. These findings were different from other studies, one done by Singh9, who reported maximum attendance in under-five and 15-24 years age groups, while Dutta and Kale10 in Pondicherry observed maximum attendance in the age group of 25-44 years and minimum in age group of 15-25 years.

According to gender, more morbidities were observed among males (61.06%) as compared to females (38.94%) but over the years from 2009 to 2013 morbidities among males decreased from 64.94% to 59.48% and among females increased from 35.06% to 40.52%. In a study by Kansal S et al.4 in Uttar Pradesh revealed that the consultations were higher for females than males in each age group except in age group of 5-15 years and almost doubled in age group of >45 years. Similar findings were observed in other studies also done by Rao et al.11, Mustafa12, Madhiwala et al.13 in India and Belcher et al.14 in Ghana. As data from Department of Obstetrics and Gynecology and Department of Skin and Venereal diseases is not reported under IDSP so morbidities related to reproductive tract were lacking in our study and this may be the reason for lower attendance of females in our study.

Seasonal distribution of morbidities shows that maximum morbidities were observed in rainy season followed by summers and then winters in our study and similar findings were seen in the study done by Kansal S et al.7 at Uttar Pradesh where most of the morbidities registered were found in rainy season followed by the winter season. Kumari R et al.7 in study at Kanpur also found maximum burden of diseases in the monsoon months than summer and winter months. It could be due to the favorable conditions during rainy seasons for the vector breeding, survival of the agent and increased agent, host and environment interaction. In our study, ARI and ADD cases were reported maximum during winter and summer, respectively. A study conducted by Sharma et al.15 in Chandigarh, Kumari R et al.7 in Kanpur and Kansal S et al.4 in Varanasi also shown similar seasonal variations with most cases of ARI being reported during winter, and ADD in summer.

There is a need for multi-centric study to be conducted to get a wider view of seasonal variation of morbidities in other regions also. This will help to draw a precise statement regarding the consistency of the seasonal variation. Nevertheless, the findings of the study are helpful for the health planners to make judicious allocation of the limited resources, to prepare in advance for impending outbreak especially during rainy seasons and further exploration of the association of the factors with the occurrence of the diseases for the achievement of the optimal health of the people.

V. LIMITATIONS:

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 of reproductive tract infections/sexually transmitted infections are mostly reported either from Department of Obstetrics and Gynecology or Department of Skin and Venereal diseases. In our institution, these departments are not reporting under IDSP which may lead to biased or under reporting. Therefore other departments should also be considered to include in reporting units to IDSP.

REFERENCES:

Table 1: Distribution of morbidities according to Gender and Age (2009-2013)

<table>
<thead>
<tr>
<th>Gender</th>
<th>2009 (N=23318)</th>
<th>2010 (N=23264)</th>
<th>2011 (N=27946)</th>
<th>2012 (N=34339)</th>
<th>2013 (N=27937)</th>
<th>Total (N=136888)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>14414 (64.94)</td>
<td>14811 (64.91)</td>
<td>16851 (60.25)</td>
<td>20807 (60.59)</td>
<td>16618 (59.48)</td>
<td>83588 (60.60)</td>
</tr>
<tr>
<td>Females</td>
<td>7824 (35.06)</td>
<td>7407 (35.09)</td>
<td>11117 (39.75)</td>
<td>13352 (39.41)</td>
<td>11319 (40.52)</td>
<td>53200 (39.40)</td>
</tr>
</tbody>
</table>

Table 2: Distribution of overall morbidities according to Season (2009-2013)

<table>
<thead>
<tr>
<th>Season</th>
<th>2009 (N=23318)</th>
<th>2010 (N=23264)</th>
<th>2011 (N=27946)</th>
<th>2012 (N=34339)</th>
<th>2013 (N=27937)</th>
<th>TOTAL (N=136888)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>6399 (28.67)</td>
<td>7953 (33.29)</td>
<td>8557 (30.74)</td>
<td>9870 (28.74)</td>
<td>10254 (36.70)</td>
<td>41073 (30.47)</td>
</tr>
<tr>
<td>Summer</td>
<td>5821 (26.08)</td>
<td>7879 (32.39)</td>
<td>9421 (33.68)</td>
<td>10795 (31.44)</td>
<td>9232 (33.05)</td>
<td>43448 (31.52)</td>
</tr>
<tr>
<td>Rainy</td>
<td>10088 (45.25)</td>
<td>8404 (34.92)</td>
<td>9580 (33.56)</td>
<td>13674 (39.82)</td>
<td>8451 (30.25)</td>
<td>50667 (37.01)</td>
</tr>
</tbody>
</table>

Table 3: Distribution of top-five morbidities according to seasons (2009-2013)

<table>
<thead>
<tr>
<th>Season</th>
<th>ARI (N=64248)</th>
<th>ADD (N=21411)</th>
<th>RTA (N=18982)</th>
<th>HTN (N=1695)</th>
<th>DM (N=9499)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>17508 (58.05)</td>
<td>4060 (20.47)</td>
<td>6670 (35.14)</td>
<td>3993 (34.14)</td>
<td>2990 (31.48)</td>
</tr>
<tr>
<td>Summer</td>
<td>11387 (24.62)</td>
<td>10272 (47.91)</td>
<td>6579 (34.66)</td>
<td>4170 (25.73)</td>
<td>3520 (27.06)</td>
</tr>
<tr>
<td>Rainy</td>
<td>17263 (37.33)</td>
<td>6779 (31.62)</td>
<td>5733 (30.20)</td>
<td>3523 (20.12)</td>
<td>2989 (21.47)</td>
</tr>
</tbody>
</table>

Fig. 1: Time trend of morbidities according to Season (2009=2013)

Fig. 2: Distribution of top five morbidities in Chandigarh according to seasons during 2009 – 2013 (ARI = Acute Respiratory Infections, ADD = Acute Diarroheal Diseases, RTA = Road Traffic Accident, HTN = Hypertension, DM = Diabetes Mellitus)