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Original Research Article

Age-sex specific mortality pattern in a tertiary care teaching hospital in North Karnataka, India

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ABSTRACT

Background: Age-sex specific mortality pattern is one of the most fundamental metrics of population health. It is the most frequently used health care indicator and a valuable tool for planning and management in hospitals.
Methods: A retrospective study of all deaths that occurred in the year 2020 in Hangal Sri Kumareshwar hospital and research centre, Navanagar, Bagalkot, Karnataka was done by analyzing the records from medical records department after institutional review board clearance. Data regarding age, sex, area of residence, ward of admission and cause of death was noted and analyzed using percentages and Chi square test. Cause of death was classified according to ICD 10.
Results: Out of 455 deaths in the year 2020, males contributed to 63.30% of the deaths and females to 36.70% deaths. Maximum number of deaths occurred between 61 to 80 years (28.79%) followed by those between 41 to 60 years (27.47%) and 20 to 40 years (20.66%). Maximum number of deaths was due to a non-communicable disease (62.86%). Cardiovascular disease contributed to 28.57% of the total deaths. COVID-19 contributed to 6.37% of the deaths.
Conclusions: Large scale investment in medical infrastructure to treat non communicable disease (NCDs) and increased health insurance coverage will be helpful in the long term plans. Awareness regarding a healthy life style can reduce the risk factors for NCDs and avoidable mortality. Preventive measures to curtail COVID-19 pandemic are the need of the hour. Estimates of premature mortality are essential to reduce preventable deaths and improve population health.

Keywords: Age-sex specific mortality, Hospital deaths, Non communicable disease

INTRODUCTION

Age-sex specific mortality pattern is one of the most fundamental metrics of population health. It is the most frequently used health care indicator and a valuable tool for planning and management in hospitals.[1] The cause of death certified by a physician using the rules and procedures of the ICD is described as the gold standard for cause of death reporting.[1]

Tracking age-sex specific death rates by cause is an essential component of health surveillance. Recent health challenges such as the emergence of COVID-19 virus or the ongoing challenges of chronic alcoholism deaths and road traffic accidents affect health system decision making.[2]

Trends in cause specific mortality can inform decision makers about what programmes might be working, where progress lags behind and the emergence of new or unexpected health challenges. The broader health agenda of SDGS requires expanded tracking of a number of NCDs and injuries. Support for this expanded agenda in a world of complex health changes requires comprehensive, comparable and timely estimates of causes of death by

cause and by age, sex, location and year.[2] Hence, this study was conducted to know the age-sex specific mortality in Hangal Sri Kumareshwar hospital and research centre which was a tertiary care teaching hospital in Navanagar, Bagalkot, Karnataka state.

METHODS

A retrospective study of all deaths that occurred in the year 2020 in Hangal Sri Kumareshwar hospital and research centre, Navanagar, Bagalkot, Karnataka was done by analyzing the records from medical records department after institutional review board clearance. Data regarding age, sex, area of residence, ward of admission and cause of death was noted and analyzed using percentages and Chi square test. Cause of death was classified according to ICD 10 in the medical records department of the hospital.

RESULTS

Out of 455 deaths in the year 2020 in Hangal Sri Kumareshwar hospital and medical research center, Navanagar, Bagalkot, Karnataka, it was observed that maximum number of deaths occurred in August contributing to 14.07% of the total deaths and the least number of deaths was in October (5.27%).

Males contributed to 63.30% of the deaths and females to 36.70% deaths. Majority of the deaths (76.70%) were in those from Bagalkot district followed by 8.57% from Vijayapura district and 7.03% from Belagavi district. Remaining were from neighboring districts of Gadag, Koppal, Raichur, Dharwad and Yadgir. It was noted that 67.47% were from rural areas and 32.53% were from urban areas (Table 1).

Maximum number of deaths occurred between 61 to 80 years (28.79%) followed by those between 41 to 60 years (27.47%) and 20 to 40 years (20.66%) (Table 2).

Table 1: Distribution according to area of residence.

Area	Male	%	Female	%	Total	%
Rural	187	64.93	120	71.86	307	67.47
Urban	101	35.07	047	28.14	148	32.53
Total	288	100	167	100	455	100

DF=1; x^2=2.31; p=0.06468.

Table 2: Distribution of mortality according to age and sex.

Age	Male	%	Female	%	Total	%
Early neonate <7 days	27	9.38	05	2.99	32	7.03
Late neonate 8-28 days	05	1.74	12	7.18	17	3.73
29 days to 1 year	07	2.43	00	0	07	1.53
1 to 5 years	04	1.39	01	0.60	05	1.10
5 to 10 years	07	2.43	04	2.40	11	2.42
10 to 19 years	06	2.08	08	4.80	14	3.10
20 to 40 years	53	18.40	41	24.55	94	20.66
41 to 60 years	83	28.82	42	25.15	125	27.47
61 to 80 years	82	28.47	49	29.34	131	28.79
>81 years	14	4.86	05	2.99	19	4.17
Total	288	100	167	100	455	100

DF=9; x^2=25.06; p=0.002904.

Table 3: Distribution according to department of admission to hospital.

Departments	Male	%	Female	%	Total	%
Medicine	109	37.84	67	40.11	176	38.68
Cardiology	26	9.02	18	10.77	44	9.67
Neurology	33	11.46	14	8.38	47	10.33
Neurosurgery	14	4.86	4	2.40	18	3.96
Nephrology	4	1.39	3	1.80	7	1.54
Surgery	22	7.64	17	10.18	39	8.57
OBG	-	-	6	3.60	6	1.32
NICU	33	11.46	17	10.18	50	10.99
PICU	18	6.25	7	4.19	25	5.49

Continued.

Departments	Male	%	Female	%	Total	%
Orthopedics	4	1.39	3	1.80	7	1.54
Plastic Surgery	0	0	3	1.80	3	0.66
Gastroenterology	1	0.35	0	0	1	0.22
Covid 19	22	7.64	7	4.19	29	6.37
Urology	1	0.35	0	0	1	0.22
Dermatology	0	0	1	0.60	1	0.22
Oncosurgery	1	0.35	0	0	1	0.22
Total	288	100	167	100	455	100

DF=15; x^2=26.02; p=0.03780.

Table 4: Distribution of male and female deaths according to type of communicable and non-communicable disease.

Diseases	Male	%	Female	%	Total	%
Communicable disease						
COVID-19	22	7.64	07	4.19	29	6.37
Infectious and parasitic disesase	30	10.42	24	14.37	54	11.87
Inflammatory disorders of CNS	20	6.94	12	7.18	32	7.03
Infections specific to perinatal period	04	1.39	05	2.99	09	1.98
Respiratory infections	15	5.21	06	3.59	21	4.62
Infections of skin and subcutaneous tissue	13	4.51	11	6.59	24	5.27
Total	104	36.11	65	39.92	169	37.14
Non-communicable disease						
Pregnancy, childbirth and puerperium	_	_	07	4.19	07	1.54
Conditions in perinatal period	30	10.42	11	6.59	41	9.01
Digestive system	25	8.68	02	1.20	27	5.93
Respiratory system	07	2.43	10	5.99	17	3.74
CVD	83	28.82	47	28.14	130	28.57
Tumors	03	1.04	02	1.20	05	1.10
Congenital malformations	02	0.69	00	00	02	0.44
Burns	02	0.69	08	4.79	10	2.20
OP poisoning	06	2.08	03	1.80	09	1.98
Others-RTA	20	6.94	06	3.59	26	5.71
Genito urinary	06	2.08	06	3.59	12	2.64
Total	184	63.89	102	60.08	286	62.86

DF=16; x^2=45.86; p=0.0001023; NCD: DF=10; x^2=40.01; p value=0.00001685; CD: DF=5; x^2=5.873; p value=0.3188.

Regarding deaths in respective wards, it was observed that maximum deaths were in general medicine ward (38.68%) followed by deaths in neonatal intensive care unit (10.99%). COVID-19 contributed to 6.37% of the deaths (Table 3).

Maximum number of deaths was due to a non-communicable disease (62.86%) and communicable diseases were responsible for 37.14% of the deaths (Table 4).

Cardiovascular disease contributed to 28.57% of the total deaths and was the leading cause in the 61 to 80 years age group and the 41 to 60 years age group. Diabetes mellitus was noted in 11.87% of the total deaths. Chronic liver disease was seen in 4.40% of the deaths and 60% of them were between 31 to 50 years of age. Road traffic accident was responsible for 3.96% of the deaths.

Infectious and parasitic diseases were responsible for 11.87% of the total deaths. Retro viral disease and tuberculosis was noted in 3.74% of the total deaths.

Out of the total COVID-19 deaths, maximum number (37.93%) were between 61 to 70 years of age followed by 24.14% between 51 to 60 years and between 71 to 80 years of age each. Diabetes mellitus was observed in 44.83% of COVID-19 deaths.

Regarding neonatal deaths, low birth weight was responsible in 51.02% of the deaths followed by 24.49% due to birth asphyxia. Septicemia was observed in 14.29% of the deaths. Congenital anomaly was seen in 10.20% of the neonatal deaths.

About deaths between 20 to 40 years of age, it was observed that maximum number of male deaths in this age group was due to road traffic accident contributing to

24.53% of the deaths followed by 15.09% deaths due to infectious and parasitic diseases and 11.32% due to chronic liver disease. In females of the same age group, the most common cause of death (21.95%) was due to infectious and parasitic diseases followed by 19.51% deaths due to burn injuries. Eclampsia contributed to 12.20% of the deaths in this age group.

DISCUSSION

The 2030 United Nations sustainable development goals have become an organizing framework for assessing progress in global health and development. Seven of the targets under the third goal (ensure healthy lives and promote wellbeing for all at ages) necessitate the measurement of cause specific mortality.[3]

Health progress in India was relevant to achieve global goals as India has a large percentage of the world's poor and global premature mortality.[4]

Our study revealed that maximum number of deaths occurred in August 2020 and corresponds to the first wave of COVID-19 pandemic and had created havoc in the lives of people around the world. Preventive measures were being carried out throughout the world by vaccination. Precautionary measures like social distancing, wearing of mask and sanitization was the need of the hour and for many more years to come due to the mutation of the deadly virus. Overall maximum deaths were observed in males and this finding was similar to other studies.[5-7] It was noted that majority of the deaths were from the subjects residing in rural areas and this finding was similar to another study.[7] This indicated the need for health care infrastructure upgrading along with human resource to manage the morbidity.

Overall, cardiovascular disease was responsible for majority of the deaths and this finding was similar to other studies.[7,8] This finding indicated epidemiological transition from communicable disease to non-communicable disease and more attention was needed to decrease premature mortality in younger age groups.

It was observed that half of the neonatal deaths were due to low birth weight and about 25% due to birth asphyxia. This finding was similar to another study.[9] Neonatal death was a proxy for evaluating national program aimed at newborn. Kangaroo mother care should be encouraged due to the limited resources.

In the 20 to 40 years age group, road traffic accidents and chronic liver disease were the major contributor for male deaths. These deaths could be averted with strict vigilance and public health laws in the country. In females of the same age group, infectious and parasitic diseases was the leading cause and indicates nutritional aspect of these women. Burn injuries were the next leading causes and indicates social issues prevailing in the society. More vigilant antenatal care can prevent eclampsia related deaths in the community. Premature mortality by age 60 accounted for one-third of total deaths in low and middle countries.[10]

CONCLUSION

Large scale investment in medical infrastructure to treat NCDS and increased health insurance coverage will be helpful in the long term plans. Awareness regarding a healthy life style can reduce the risk factors for NCDs and avoidable mortality. Preventive measures to curtail COVID-19 pandemic are the need of the hour. Estimates of premature mortality are essential to reduce preventable deaths and improve population health.

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