

STUDIES ON DIARRHOEAL DEATHS AMONG HOSPITALIZED PATIENTS IN THE CENTRAL HIGHLANDS Vietnam DURING 1991-2000

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Introduction

Diarrhoeal diseases represent a major public health problem in many areas of the world. It is estimated that there are approximately 1.3 episodes and almost 5 million deaths annually in children younger than 5 years. It is estimated to cause 4% of all deaths and 5% of disabling health loss. It is the one of the principal causes of major health problems in the provinces of Dak Lac, Gia Lai and Kon Tum, as well as in Viet Nam as a whole [1,2].

We review data of death cases caused by infectious disease from 1991 to 2000 from 3 provincial hospitals of the central highlands. These hospitals have the responsibility to carry out medical treatment for all residents of the 3 provinces of Dak Lak, Gia Lai and Kon Tum, in order to promote plans corresponding to the facts of these areas.

Methods

Data from patients who died due to diarrhoea and infectious diseases for the period 1991 to 2000 were collected using death registries and medical files from archive departments of the 3 hospitals of the Central Western Highlands of Vietnam.

Statistical tests were employed in the analyses of data. A $p < 0.05$ was considered significant.

Results

Table 1. Distribution of causes of death by order of magnitude

| Causes of death | Number of death |
|--------------------------|-------------------|
| Malaria | 850 (47.94) |
| Tuberculosis | 214 (12.06) |
| Diarrhoea (*) | 204 (11.50) |
| Tetanus | 127 (7.16) |
| Neonatal tetanus | 101 (5.70) |
| Plague | 48 (2.70) |
| Pertussis | 40 (2.25) |
| Viral hepatitis | 32 (1.80) |
| Dengue hemorrhagic fever | 28 (1.58) |
| AIDS | 28 (1.58) |
| Rabies | 24 (1.35) |
| Diphtheria | 19 (1.08) |
| Measles | 16 (0.90) |
| Encephalitis | 14 (0.79) |
| Leptospirosis | 12 (0.68) |
| Meningitis | 7 (0.40) |
| Typhoid | 4 (0.22) |
| Poliomyelitis | 3 (0.20) |
| Mumps | 2 (0.11) |
| Total | 1773 (100) |

Figures in parenthesis are percentages

(*) Including bacillary and amoebic dysentery (131 cases)

Table 1 shows a total of 1773 cases of death caused by infectious disease from 1991 to 2000. Table 1 also shows the five leading causes of death were malaria (47.94%), tuberculosis (12.06%), diarrhoea (11.50%), tetanus (7.16%) and neonatal tetanus (5.7%). In general, the number of deaths from infectious disease decreased markedly, but the number of deaths caused by diarrhoea were unchanged (see Figure 1).

Figure 1. Number of Cases of Diarrhoea and Infectious Disease vs. Year

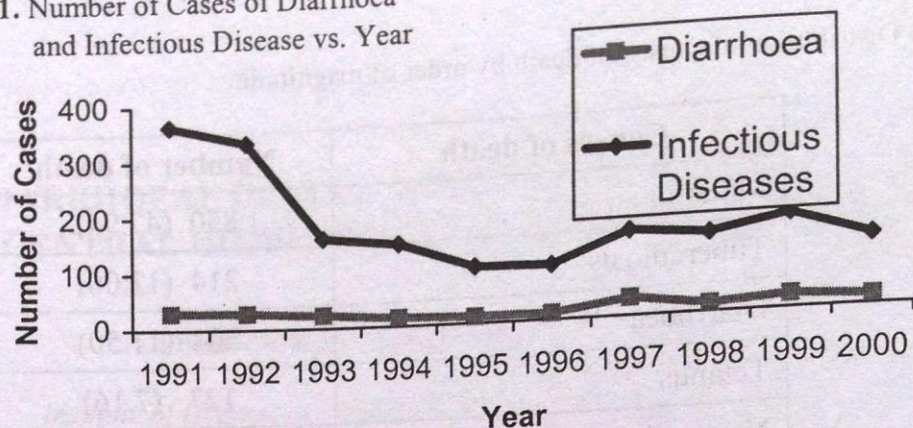


Table 2. Distribution of some cases of death by sex

| Diseases | Male | Female |
|--------------------|-------------|------------|
| Acute diarrhoea | 44 (60.3) | 29 (39.7) |
| Dysentery (*) | 76 (58.0) | 55 (42.0) |
| Infectious disease | 1062 (59.9) | 711 (40.1) |

Figures in parentheses are percentages.

(*) Including bacillary and amoebic dysentery (131cases)

A chi squared analysis of these data supports the following: The proportion of deaths from acute diarrhoea *is* significantly different between the sexes;

The proportion of deaths from Dysentery is *not* significantly different between the sexes;

The proportion of deaths from Infectious disease in total *is* significantly different between the sexes (Based upon estimated (expected) total proportion of males:females in the three provinces being 49:51, $\chi^2_{0.05, df=1} = 3.84$).

Table 3. Distribution of some death cases by ethnic minority

| Diseases | Kinh group | Ethnic minority group |
|-----------------|-------------|-----------------------|
| Acute diarrhoea | 31 (45.6) | 37 (54.5) |
| Dysentery | 76 (58.9) | 53 (41.1) |
| Total (a) | 1153 (67.4) | 558 (32.6) |

Figures in parentheses are percentages

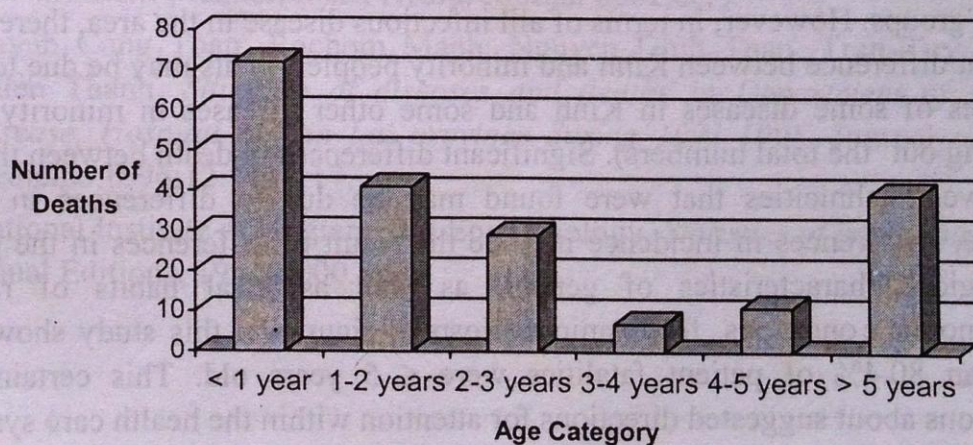
(a) Missing information about 62 reported deaths.

A chi squared analysis of these data supports the following: The proportion of deaths from acute diarrhoea is significantly different between the Kinh and ethnic minority groups; The proportion of deaths from Dysentery is significantly different between the Kinh and ethnic minority groups; The proportion of deaths from Infectious disease in total is *not* significantly different between the Kinh and ethnic minority groups (Based upon estimated (expected) total proportion of Kinh:ethnic minority in the three provinces being 70:30, $\chi^2_{0.05, df=1} = 3.84$).

Table 4. Distribution of diarrhoeal deaths by age.

| Age | Diarrhoea | Percentage |
|-----------|-----------|------------|
| 1 | 72 | 36.2% |
| 2 | 41 | 20.6% |
| 3 | 29 | 14.6% |
| 4 | 7 | 3.5% |
| 5 | 11 | 5.5% |
| > 5 years | 39 | 19.6% |
| Total | 199 | 100% |

Figure 2. Distribution of Diarrhoea Deaths by Age



From 1991 to 2002, a total of 199 cases of death by diarrhoea were reported in the 3 provincial hospitals. 80.4% of mortality occurred in ages ≤ 5 years.

Discussion

A complete statistical explanation of hospital deaths in general is very difficult because of the influence of many factors. In this study, it was found that the numbers of deaths from infectious disease were decreasing markedly. Other researchers have made observations regarding death by infectious disease in this area which show similarity to those results found in our study [3,4].

This decrease was due to a decrease in the number of deaths from malaria, the most serious cause of death in the central highlands. The number of other deaths from tetanus, and plague also decreased. These decreases were caused by many factors, such as improvements in active control programs within communities (malaria control, Expanded Immunization Program, *etc.*). Patients were diagnosed earlier. In addition, medical equipment and the expertise of health professionals and practitioners has been increasing. Diarrhoeal deaths were unchanged. The current programme for control of diarrhoeal disease needs an element of prevention, and this is important because distances patients need to travel for treatment are usually great.

Overall, we found a significant difference between the sexes in the incidence of death from infectious disease, with males suffering greater mortality than females. But the exact difference depend upon the disease. For example, there was no significant difference between the number of deaths in males and females due to dysentery, but there was by diarrhoea. The combined deaths by dysentery and diarrhoea show significant difference between the sexes. Significant differences were found when comparing deaths for both dysentery and diarrhoea for Kinh vs. ethnic minority groups. However, in terms of all infectious disease in the area, there was no significant difference between Kinh and minority peoples. (This may be due to higher incidences of some diseases in Kinh and some other diseases in minority groups 'averaging out' the total numbers). Significant differences in death between the sexes and between ethnicities that were found may be due to differences in disease incidence. Differences in incidence may be the result of differences in the psycho-physiological characteristics of gender, as well as local habits of race, or socioeconomic conditions, for example. Hospital figures in this study showed that more than 80.4% of patient fatalities were ≤ 5 years old. This certainly has implications about suggested directions for attention within the health care system.

Conclusions

There were 1,773 deaths due to infectious disease in the 3 provincial hospitals of the Western of Central Highlands, Viet Nam during the period 1991 – 2000. The five leading causes of death were malaria (47.94%), tuberculosis (12.06%), diarrhoea (11.50%), tetanus (7.16%) and neonatal tetanus (5.7%). In general, the number of

deaths from infectious disease decreased markedly during the study period, but the number of deaths caused by diarrhoea was unchanged.

The number of deaths by overall infectious disease was significantly different between males and females. There was a significant difference between the number of deaths by diarrhoea between the sexes, but not by dysentery.

There was no significant difference in the distribution of overall infectious disease by ethnic minority, though the number of deaths by diarrhoea and dysentery in ethnic minority groups was always significantly more than that for the Kinh group. 80.4% of 199 cases of death by diarrhoea were in patients ≤ 5 years old.

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