INTRODUCTION

Childhood mortality is a major health burden to the society and a prominent public health issue. In one series on child survival published in Lancet, under-five mortality was described as public health disaster [1]. In response to the burden of childhood mortality in sub-Saharan African countries, United Nations and World Health Organization (WHO) has incorporated reduction of childhood mortality by two-third by the year 2015 as one of its millennium development goals. In 2014, the under-five mortality rate (U5MR) was reported as 66/1000 live births as one of its millennium development goals. In 2014, the under-five mortality rate (U5MR) was reported as 66/1000 live births although this represents 50% decrease on the U5MR reported in 1990 [2].

Under-five children constitute 20% of India’s population, which makes every unit change in mortality to reflect great effect in the population [3]. Identifying determinants of under-five mortality are essential for formulating appropriate health programs and policies. In a bid to address this problem and health inequities, India has adopted specific proven interventions to address childhood mortality. Developing these interventions, there is the need to understand the multiplicity of factors that determine child mortality, especially in resource poor settings.

METHODS

This study was a hospital-based cross-sectional study on under-five children, carried out in the Department of Pediatrics in a tertiary care hospital from January 2013 to December 2014. All the children admitted to the inpatient Department of Pediatrics from 1 month to 5 years were included in the study group and those who died were further explored.

RESULTS

Maximum number of death occurred due to central nervous system infection (25.5%) followed by acute respiratory tract infections (19.5%) and complicated malaria (17.2%). Death occurred due to measles and its complication was 1.1% during the study. The percentage of death was higher among rural children (65.2%), children belonged to joint families (63.3%), backward classes (82.8%), low education, and the 1st order birth (49.1%).

CONCLUSION

Specific efforts to combat under-five mortality are needed. In order of priority, the promotion of female education, gender equity, family planning, and addressing the vast socioeconomic differentials in Odisha is important steps to improving under-five survival.

Keywords: Under-five death, Child mortality, Central nervous system infection.
duration of pre-hospitalized treatment, level of pre-hospitalized treatment, and severity of illness as per Yale observational scale [9] was recorded on the day of admission.

RESULTS

There were a total of 3164 admissions into the pediatric ward of the hospital during the study. Among total admission majority belonged to 1-3 years age group, i.e., 39.7%, male children admission was 2070 (65.8%) and female children admission was 1076 (34.2%) with male and female admission ratio 1.9:1. Among the admissions, 267 deaths were recorded.

Table 1 shows that among the 3164 hospitalized children (1 month - 5 years), death occurs in 267 children (8.5%). Among total admission majority belonged to 1-3 years age group (116) compared to higher age group (p<0.001). Male children admission 2070 (65.8%) was more than the female 1076 (34.2%) with male and female admission ratio 1.9:1. Among the admissions, 267 deaths were recorded.

Table 2 shows that the percentage of death was higher among rural children (65.2%) than their urban counterpart (34.8%). Distribution of death according to type of family indicated that highest risk of mortality observed in children belonged to joint extended families (48.7%) and least death in children belonged to joint families (14.6%). Basing on caste, the mortality rate in under-five children was significantly lower in general caste (17.2%) than backward classes (82.8%). Under-five deaths found to be significantly higher in the 1st order birth (49.1%) as compared to all other groups. The minimum risk of mortality when the age of mother more than 35 years (0.7%) and educational status of mother are high (9.7%).

Table 3 shows that the risk of mortality was significantly high among partially and not immunized children (67.4%) than the immunized group (32.6%). The under-five death was lower among the children having normal nutritional status (33.3%) compared to those having some degree of malnutrition (66.7%). Majority of death occurred in children those who admitted after 7 days of illness (42.3%) than the other groups. Likewise, death among the groups those who received a prolonged treatment (more than 3 days) and late referral was higher (68.9%) compared to those who presented to hospital earlier (31.1%). According to Yale scoring system, death among the children having more severe illness (9.3%) outnumbers the counterpart (6.7%). Fig. 1 shows that a maximum number of death occurred due to central nervous system infection (25.5%) followed by acute respiratory tract infections (ARI) (19.5%) and complicated malaria (17.2%). Least death occurred due to measles and its complication (11.1%) during the study.

DISCUSSION

The highest number of mortality was seen in children below 1 year (1 month - 1 year) which is consistent with all literature and study available [10]. This may be due to this immature immune system or subtle manifestation of disease leading to late presentation to hospital. Male admission (65.8%) was higher than the female admission (34.2%) which may be because of social stigma and early health-seeking behavior tends to favor boys. The mortality rate in female (9.9%)
was higher than the male mortality (7.7%) which contradicts the international finding [11]. This apparent discrepancy may be explained by the unfortunate gender bias in the locality in leading to the late referral.

The study showed that the variables such as mother age, level of education, order of birth, and family pattern were significantly associated with under-five deaths in these largely rural settings. Another study from developing country [12] indicates that the mother having completed primary level of education has 33-42% less risk of early childhood mortality compared with uneducated mother. In addition, where the mother had higher education, there is less risk of mortality (82.84%) than the uneducated counterparts. Maternal age has been found to have an inverse relationship with under-five mortality similar to other studies [13,14], as the risk of mortality is the lowest among the children when mother age >35 years. The advantage related to less mortality may be because of improved maternal experience in child rearing which prevailed over the drawback of advance maternal age.

The risk of mortality increases with delayed presentation, late referral, treatment from unqualified person, and severity of illness. This may be due to unavailability of suitable medical access, poor transportation, or referral system in this part of country.

In our study, the most common factor behind the cause of death is CNS infection (25.5%), ARI (19.5%), malaria (17.2%), and severe infection (12.7%). Although the WHO (2008) reported that in developing countries diarrhea (19%), ARI (13%), measles (10%), and prematurity (10%) were considered as the cause of under-five children [15], the percentage of diarrheal death and its complications was less (7.9%) in our study, this might reflect a trend in the fall of diarrheal death in country.

CONCLUSION
The causes of high under-five mortality in resource poor settings are complex and merit concerted efforts to clarify their implications to improve child survival. On the basis of these findings, we suggest that specific efforts with focus on under-five mortality decline need to target the individual needs and welfare of women. In order of priority, the promotion of female education, gender equity, family planning, and addressing the vast socioeconomic differentials in Odisha is important social steps to improving under-five survival.

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