FEASIBILITY OF WIGGLESWORTH PATHOPHYSIOLOGICAL CLASSIFICATION FOR PERINATAL MORTALITY IN SAINT PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE, ETHIOPIA

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ABSTRACT

BACKGROUND: Perinatal mortality of a country is often used as a measure of the adequacy of obstetric and neonatal services. Several classification systems have been in use with their own advantages and disadvantages. Studies have reported Wigglesworth classification to be simple and reproducible. There are no reports regarding its use and feasibility in Ethiopia.

OBJECTIVE: The aim of this study was to review perinatal deaths at Saint Paul's hospital millennium medical college and see the feasibility of Wigglesworth classification.

METHODS: A one-year review of perinatal deaths at Saint Paul's Hospital millennium medical college from January 2014 to December 2014 was conducted. The deaths were analyzed using Wigglesworth classification.

RESULT: Perinatal mortality rate was found to be 70.1/1000 live births. Majority of the perinatal mortality were still births (72%). According to Wigglesworth classification of the perinatal deaths 47% were Macerated still births, 25.7% perinatal asphyxia. Other causes mortality was; lethal congenital malformations (10%), prematurity (10.7%) and septicemia (5.7%) were mortality. Wigglesworth classification was found to be feasible at SPHMMC.

CONCLUSION Macerated stillbirths and perinatal mortality were leading causes of perinatal mortality at SPHMMC. Wigglesworth classification is a simple and feasible system to be applied in Ethiopian hospitals.

Key words: Perinatal mortality, Wigglesworth classification, Ethiopia

INTRODUCTION

According to WHO estimate greater than 7.8 million perinatal deaths happen worldwide of which more than 98 percent in developing countries[1]. The still birth rate in Africa is largely unknown because of lack of reports. Ethiopia has showed a huge reduction on infant mortality in the past decade. But perinatal mortality remains high. Ethiopian health and Demographic surveillance reported a slow reduction on perintal mortality from 46/100 live births in 2001 to 29 in 2016[2].

The perinatal mortality rate of a country is often used as a measure of the adequacy of obstetric and neonatal services. Countries use various methods to examine the problem and to suggest recommendations for the improvement of perinatal care. Any attempt to analyze perinatal mortality data usually faces the problem of selecting or developing a classification system for the causes of deaths. Classification systems vary with the specialty of the individual who proposes them. Several classification systems have been proposed by obstetricians, neonatologists/pediatricians, perinatal pathologists and epidemiologists[3].

Each classification has its strengths and weaknesses. When selecting a classification system, it is important to understand the aims. The aim of any classification of perinatal deaths should be to derive strategies for the prevention of perinatal mortality. Obstetric classifications concentrate on maternal factors and take little account of the fetal/neonatal clinical pathological processes. Pathological classifications depend heavily on the availability of autopsy services. It is difficult to obtain in countries like Ethiopia because of cultural and religious beliefs.

Classification of perinatal deaths is accepted as a crucial step towards the goal of reducing the numbers of stillborn infants. However, the use of suboptimal classification systems may lead to a loss of important information and contributes to a high proportion of unexplained deaths. These deaths may be interpreted as unavoidable thereby diminishing the potential of immediate and longer-term prevention strategies including research to address knowledge gaps[4].

Aberdeen's obstetric classification is widely used in Ethiopia but has limitation of classifying a high number of unexplained causes. It has limitation of detecting fetal pathologies. Wigglesworth classification is found to be reported simple, reproducible, and can be used without autopsy. This classification system has been reported to be feasible in tertiary and district hospitals in Bangladesh and Malaysia[3, 4].

Wigglesworth classification system classifies the perinatal deaths as: normal macerated, congenital malformation, immaturity, perinatal asphyxia, and others. This study was conducted with the aim of analyzing perinatal mortality using Wigglesworth classification and assesses the feasibility of using this classification in a tertiary care hospital setting.

SUBJECTS AND METHOD

A one-year retrospective study was conducted by analyzing births at Saint Paul's Hospital millennium medical college (SPHMMC) over a period between January 2014 and December 2014.

All births and perinatal deaths in the study period were recorded from labor ward log books. Information on weight, sex, gestational age (from last menstrual period), mode of delivery, presence of any lethal congenital anomalies, and type of stillbirths (macerated or fresh) were recorded from the charts. Early neonatal deaths, which died within seven days of delivery, were identified from record books in neonatal intensive care unit (NICU).

Data was entered and analyzed using computer SPSS software version 15.0. The perinatal deaths were analyzed according to Wigglesworth classification. The stillbirth rate, early neonatal mortality rate, perinatal mortality rate was calculated manually. Ethical clearance obtained from SPHMMC Institutional Review Board (IRB).

Operational Definitions

⇒Stillbirth is death of fetus > 28 weeks of gestation or > 1000gram.

⇒Early neonatal deaths, death of a newborn in the first seven days of life (0-6 days).

⇒Perinatal mortality rate − is the sum of late of birth divided by the sum of live births plus late fetal deaths and expressed per 1000 live births plus late fetal deaths.

RESULT:

A total of 4,890 births were reported in the study period at Saint Paul's hospital Millennium medical college. A total of 347 perinatal deaths reported making perinatal mortality rate to be 70.9/1000 live births. Among the perinatal deaths 251 were stillbirths and 96 early neonatal deaths. The still birth rate was 51/1000 live births. It was possible to get only to trace 280 charts for review and the chart retrieval rate was 80 %. The male to female ratio is 1.5:1. Twenty-three percent of the deaths have been delivered by cesarean section and three percent by destructive delivery.

Majority (66.4%) of perinatal deaths occurred among mothers who were referred from outside Addis Ababa. Most mothers were booked for ANC (86%) and the mean maternal age was 26 years. The mean gestational age was 36 weeks. Majority of the deaths happened in the low birth weight. Seventy-eight percent of patients had labor at admission and 15% had malpresentations. Of which 12 percent were breech and three percent other forms of malpresentations (Table 1).

Perinatal deaths were analyzed using Wigglesworth classification method. Accordingly, majority (47.5%) were macerated still births. Perinatal asphyxia contributed to 25.7 %, of the deaths. Lethal congenital malformations (10.3%), prematurity (10.7%) and septicemia (5%) were other causes of mortality (Table 2).

The common causes of early neonatal deaths were perinatal asphyxia, respiratory distress and sepsis. Seventy-five percent of them had hypothermia. The feasibility assessment of Wigglesworth classification revealed that, most variables are documented on the logbook or patient chart and it as feasible to make use of it.

Table 1 Distribution of Perinatal deaths in SPHMMC by maternal demographic and obstetric factors, 2015

Variable	Number	%
Maternal age		
< 20	46	16.4
20 to 25	96	34.3
26 to 30	102	36.4
31 to 35	24	8.6
>35	12	4.3
Address		
Addis Ababa	94	33.6
Outside Addis	186	66.4
Parity		
Prim gravid	182	65
Multiparous	98	35
Booking status		
Booked	241	86.1
Not Booked	39	13.9
Stage of labor		
first stage	88	44
second stage	48	24
Prelabour	64	32
Number of gestations		
singleton	262	94
twin	18	6
Sex		
Male	170	60.7
Female	110	39.3
Mode of delivery		
vaginal route	196	70
Cesarean section	65	23.2
destructive delivery	19	6.8
Presentation		
Vertex	192	68.6
Breech	34	12.1
others	9	3.2
unknown	45	16.1
Birth weight		
1000 to 1499 grams	66	23.4
1500 to 2499 gram	71	25.4
2500 to 3999 grams	138	49.3
> 4000 grams	5	1.8

Table 2 Wigglesworth path physiologic classification of perinatal deaths, SPHMMC, 2014

Causes	No.	%
Macerated still birth	133	47.5
Perinatal asphyxia	72	25.7
Congenital malformations	29	10.4
prematurity	30	10.7
septicemia	16	5.7
Total	280	100

Table 3 Perinatal mortality Adjusted by maternal age, birth weight, parity and number of gestations, SPHMMC 2015

Factor	deaths	total births	PMR /1000 live births
Birth weight in gram			
1000 to 1499	66	196	336.7
1500 to 2499	71	978	72.6
2500 to 3999	138	3521	39.2
4000	5	147	34.
Maternal age			
< 20	46	235	195.7
20 to 25	96	1516	63.3
26 to 30	102	1907	53.5
31 to 35	24	880	27.3
>35	12	333	36
Parity			
Prim gravid	182	2053	88.6
Multiparous	98	2837	34.5
Number of gestations			
singleton	262	4572	57.3
twin	18	318	56.6

DISCUSSION

The Perinatal mortality (PNM) at Saint Paul's Hospital (SPH) was found to be 70.1/1000 live births. This is higher than the national estimate which is 37/1000 live births[6]. But lower than reports from teaching hospitals in Tanzania and India, 124 and 142.5/1000 live births respectively. The proportion of still births is 72% which is similar to reports from other teaching hospitals. Saint Paul's Hospital Millennium medical college is a referral center, where complicated cases from peripheral units.

According to the Wigglesworth's classification, Perinatal asphyxia and macerated still births were leading causes of mortality which contribute to two third of perinatal mortality. This may be due to inadequate labor monitoring at referring units and delay in reaching to SPHMMC. Most of mothers referred from outside Addis Ababa. Majority of the perinatal deaths happened among mothers who were booked for antenatal care (ANC) at least once. The quality of care given might be inadequate the primary care units.

Mortality because of prematurity was higher compared to reports from India. Effective interventions like; reducing preterm deliveries, antenatal steroid, use of surfactant and ventilators in the NICU are essential for reducing mortality (6-12).

Sepsis was also another important problem (5%). Infection prevention strategies like hand washing, reducing NICU traffic, disposable equipment's and using effective antibiotics are helpful.

Perinatal asphyxia and macerated still births were leading causes of mortality. Improved obstetrics care

is needed. Wigglesworth path physiological classification is feasible in Ethiopian health system. It helped reducing the proportion of perinatal deaths classified as unexplained, a problem commonly faced by Aberdeen's classification. Wigglesworth classification is advantageous as it is simple, reproducible, and used without need for autopsy. It also provides cause specific comparisons between different nations and centers.

CONCLUSION AND RECOMMENDATION

Perinatal asphyxia and macerated still births are leading causes of perinatal mortality at SPHMMC. Wigglesworth classification is a feasible method for classifying perinatal deaths.

Wigglesworth classification can be applied in Ethiopian health system with better benefits for better perinatal care. It can be used for audit services in primary and tertiary hospitals. Better labor monitoring and effective interventions for premature births and sepsis are crucial.

CONFLICT OF INTEREST

The researchers declare that there is no conflict of interest.

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