STUDY OF MATERNAL DEATH IN AMIN HOSPITAL IN ISFAHAN, IRAN +

P. Ghanai, M.D.**
H. Emami, M.D.***
T. Kamran, M.D.**
M. Moshirfatemi, M.D.**

ABSTRACT

During a period of five years (1971-75) 29 maternal deaths occured in 15794 deliveries at the Amin Maternity Hospital in Isfahan (18.36 per 10.000).

Death was considered to be due to direct obstetrical cause in 18 cases (62.0%), indirect obstetrical cause in 8 cases (27.5%), and non-related cause in 3 cases (10.3%).

In 14 cases of 29 the maternal death was considered avoidable. Especially amongst those deaths wiht direct obstetrical casue the proportion of avoidable deaths was higher (12 out of 18 deaths).

Responsibility for short comings in action amongst avoidable deaths is examined. Lack of regular prenatal care, delay of referral, referral from far distances, unavailability of compatible blood, and cultural inhibitions are found to be the most important factors.

INTRODUCTION

In the rapidly developing country of Iran, where the family structure is still traditional, the death of a young women in childbirth

---

+ Obstetric and Gynecology Section and Department of Pathology, University of Isfahan Medical School

* Department of Obstetrics and Gynecology

** Prefessor of Pathology

is a major catastrophe. Such a tragic event has far reaching individual and social effects. The women in Iran often marry at a relatively young age and have a large family be their early twenties (1). Therefore a sudden death of a mother often leaves behind a number of children, whose upbringing must be expected to be complicated by psychological, educational and social problems.

Inspite of the scarceness of published studies on maternal deaths in Iran (2) the every-day practice of obstetrics in hospital indicates two things; firstly there is a relatively high rate of maternal deaths and secondly many of these deaths are avoidable. The present study was under-taken to examine and review critically the causes of the maternal deaths which occured during the first five years of the existence of a crowded maternity center in Isfahan.

We hope that the publication of our findings would attract the attention of the medical professon and government to this critical problem. In addition, or published material may be used as baseline date for similar studies in the future.

To our knowledge this is only the second publication on maternal deaths in Iran.

MATERIAL AND METHOD:

The Amin Maternity Hospital (AMH) was created in Isfahan in January 1971, as the main onstetrical unit of the University of Isfahan Medical School, by the remodelling of an old general hospital. The unit had fourty beds in the beginning which were increased later to seventy.

The AMH is the only open door emergency hospital for child-bearing women in the province of Isfahan and as such it receives almost all the emergency referrals from city and villages, from home delivery and from public hospital. The great majority of the patients admitted to this hospital have not been under regular prenatal care.

During the five years from January, 1971 to December 1975 a total 15,794 births have been performed in AMH. A total of 29 maternal deaths occured during this time. Records of these patients were reviewed carefully and critically in retrospect and the casue of death was re-established retroactively in each case. Whenever necessary the resident physician, who had been involved in the care of patient, was interiewed in order to obtain additional information. Unfor - tunately the autopsy rate has been negligable. Only one patient was autopsied.

Therefore the final diagnosis had to be based solely on clinical and para-clinical information and may therefore be subject to criticism. Nevertheless we are presenting our cases of maternal death to draw the attention of the medical staff, the responsible authorities and the patients to the gravity of the problem.

OBSERVATIONS AND RESULTS:

Table I show the number of deliveries and maternal deaths during the 5 year period. There is no signifficant difference between the number of maternal death during this perid. Table II shows the final diagnosis and causes of maternal deaths in each case. Following the guide for Maternal Death Studies, published by the American Medical Association in 1957 (3), we have attempted to classify our maternal deaths as 'direct', 'indirect' and 'unrelated' with regard to cause of death. Table III a shows maternal deaths due to direct obstetrical cause. As noted 18 cases or 62.0% of all maternal deaths were 'direct'. Infection, hemorrhage, and toxemia were seen most frequently. In table III_b the indirect obstetrical causes of maternal deaths are presented. Eight cases (27%) of such maternal deaths were encountered. The four maternal deaths due to hepatitis are note-worthy and are related to the fact that Isfahan is an endemic area for infections hepatitis. Non-related causes of maternal deaths in our material were seen in 3 cases only (Table III_c). The necrosis of small bowl was the cause of death in two patients. Death occured in these two patients within a few hours of bowl resection.

Maternal deaths have been classified into preventable and non-preventable (4). The judgment is based on the facts related ot measures which could have been taken by the patient and/or the medical staff and the hospital to prevent the tragic outcome. Based upon these criteria we have attempted to judge the cases which are presented in table II and suggest where the responsibility or short comings lie, (Table IV).

HEPATITIS:

Hepatitis was the most frequent single cause of maternal deaths in Isfahan. Duration of pregnancy was five months in two cases and nine months in the third case. One patient developed icterus 5 days -

after she had delivered a full term pregnancy and died 2 days later. The course of the disease was rapid. The first three patients died within twenty four hours of admission. Since no therapy is yet available for fulminating hepatitis in pregnancy all these deaths were considered unavoidable.

SEPTIC SHOCK:

There were four deaths from septic shock due to uterine infection. One patient had rupture of membrane 15 days prior to admision and died undelivered 2 hours after admission. Second patient was in labor with an impacted shoulder of 7 days duration and died three days after admission. Third patient died on the 17th past partum day. She delivered at home and was admitted on 11th day after delivery with fulminating puerperal infection. The fourth patient had septic aboration of 2 days duration and died after one hour in shock in the hospital. Delay of admission is abviously the major cause of death in the first 3 cases. All four deaths were considered avoidable but the responsibility is assigned to the patient.

ECLAMPSIA:

There were 3 deaths with eclampsia. Two occured in young primipara who died soon after giving birth to still-born infants. Delivery occured 36 hours and 9 hours after admission. These deaths may have been preventable if the patients were delivered earlier. Both patients died in respiratory failure. The third patient was a 36 years old multipara and died in status epilepticus a few hours after admission inspite of intensive therapy. This case is considered as avoidable. The fact that all these three patients had no prenatal care throws some responsibility on the patients themselves.

CHRONIC RENAL DISEASE:

There were three patients admitted with very high blood pressure and laboratory findings of chronic renal diseases. All were multipara and died in coma with renal failure. Death is considered unavoidable in these cases.

POST PARTUM HEMORRHAGE:

Two patients had post-partum inertia and died in hemorrhagic shock because of unavailability of compatible blood. One patient had severe hemorrhage and died of it after a late second trimester abortion. It is abvious that these deaths could have been avoided and the responsibility rests upon the medical institution.

REPTURE OF UTERUS:

Two patients were admitted to the hospital with rupture of uterus. In the first case the patient developed rupture of the uterus during an attempt to deliver the second twin at home. In second case the patients was a grand multipara and had prolonged labor at home. Both patients died on the operating table with hemorrhagic shock. Compatible blood was not available. These death were considered avoidabel and responsibility is assigned to both the medical institution and the patient.

PULMONARY EMBOLISM:

One patient was found dead in bed five hours after a normal delivery. The other patient was a five month pregnant women with threatened abortion who died suddenly at bed side after she went to the bath-room early in the morning. Death was considable in both cases.

CARDIAC ARREST UNDER ANESTHESIA:

Two patients died from cardaic arrest under anesthesia during cesarean section. One patient had general anesthesia and the second patient has spinal anesthesia. Death waz considered probably unavoidable.

OTHER CAUSES OF DEATH:

Cerebral-vascular accident was the cause of death in two patients during the early postpartum period (unavoidable). One patient died with miliary tuberculosis. She was a five months pregnant women who was transferred to AMH from the tuberculosis sanatorium in Isfahan.

She died three hours after an spontaneous abortion (unavoidable). Two patients died with massive intestinal gangrene due to mesenteric thrombosis is one case, and volvulus of large bowl in the other (avoidable, responsibility assigned to the patient). Both patients died after bowl resection.

One patient died with advanced laryngeal carcinoma (unavoidable). She died 5 hours after having delivered normally a full term pregnancy.

DISCUSSION:

The rate of maternal death in America has decreased steadily during the last sixty year (5, 6, 7). The decrease was reported to be more rapid during 1937 through 1955 (6). Currently the rate is remarkably low and is reported on average to about 3 per 10.000 live births (6). The rates for European countries are slightly lower (8, 9,). In a home delivery service in Chicago, where patients were mostly indigent, the maternal mortality rate was reported to be about three folds (10).

Similar rates are also published for patients who referred to the Charity Hospital of Louisiana at New Orleans (11, 12).

In africa the rate is reported to be five to ten fold greater than the rates in Western countries, namely 14 to 33 per 10.000 births (13).

The first report on maternal deaths in Iran was from Daneshbod et al (2). His report on causes of deaths is based upon authopsy material of 96 deaths encountered during seven years. His figures are not related to the number of births. Eventhough our study is an institutional survey and is therefore non representative of the actual frequency of maternal deaths in the community, nevertheless the rate of 18.36 death per 10.000 births is very high and unacceptable. In order to examine the reason for this very high rate of maternal deaths we have attempted to make judgment on the avoidability of death in each case and also to assign the responsibility and shortcomings in relation to the preventable cases. Based upon information available in patients' charts we judge that out of 29 maternal deaths 14 cases or 48.2 percent were avoidable (Table IV). Of the 14 avoidable deaths 12 cases were due to obstetrical cause. For these cases we tried to assign responsibility and found that it rested in 3 cases with the patient, in 3 cases with the physician and in 6 cases with both. Patients usually referred to the hospital only after considerable delay and were often forced to travel long distances. Unavailability of blood and other

facilities for medical care at the hospital have attributed to causing death in several of our cases. That responsibility was assigned to patients to quite a large extent is supported also by data presented in Table V and VI. In table V the patients are divided according to the time of development of the complication causing maternal death and to the time of admission. Only one out of five patients developed their complication after their admission to the hospital. Table VI shows the duration of hospital stay of patients prior to death. As noted 34.4 percent of all patients died with in the first twenty four hours of their arrival in the hospital.

The maternal death rates have decreased rapidly in Western countries because of many factors of which regular prenatal care and availability of medical and institutional facilities have been the most important. Establishment of reviewing committees for maternal death has been effective in improving obstetrical care (8, 4). In Iran where adequate medical and institutional facilities for obstetrical care are usually unavailable to the rural population, where the prenatal care among indigent patients, even in the cities, is not the usual practice, and where cultural inhibition and prejudice often cause lack of cooperation between patients and the medical profession the rate of maternal deaths is expected to remain high and decrease only slowly in the near future. In view of the above mentioned difficulties, it is the responsibility of medical profession to take every possible measure to lower the maternal death rate in Iran. The recent rapid development of government medical insurance schemes may be a very good opportunity for a massive endeavour to improve overall obstetrical care.

ACKNOWLEDGEMENT:

Our gratitude is due to Dr. M. SARRAM for his guidance and assistance and also to Dr. R.V. WENN for reviewing the manuscript.

Table I: Number of deliveries, and maternal deaths in AMH (1971 through 1975)

Year	No. of births*	Maternal deaths	Rate per 10.000 births
1971	1614	5	30.97
1972	2647	4	15.11
1973	3506	6	17.11
1974	3764	5	13.28
1975	4263	9	21.11
	15794	29	18.36

* Includes still-births

Table II: Final diagnosis of maternal deaths

Diagnosis	No.	%
Hepatitis	4	13.79
Septic shock	4	13.79
Post partum hemorrhage	3	10.34
Eclampsia	3	10.34
Chronic renal disease	3	10.34
Pulmonasy embolism	2	6.89
Cardiac arrest under anesthesia	2	6.89
Cerebral vascular accident	2	6.89
Rupture of uterus	2	6.89
Pulmonary tuberculosis	1	3.44
Intestinal gangerene	1	3.44
Mesenteric thrombosis	1	3.44
Carcinoma of larynx	1	3.44
	29	99.92

Table IIIa: Direct obstetrical causes of maternal deaths in Amin Maternity Hospital 1971-1975

Causes	No.	
Infection		4
Septic shock following abortion	1	
Antipartum infection	1	
Puerperal uterine infection	2	
Hemorrhage		5
Post-partum uterine inertia	3	
Uterine rupture	2	
Toxemia		
Eclampsia		3
Anesthesia		
Cardiac arrest		2
Cerebral hemorrhage		2
Pulmonary embolism		2
		18

Table IIIb: Indirect obstetrical causes of maternal deaths in Amin Maternity Hospital 1971-1975

Causes	No.
Hepatitis	4
Chronic renal disease	3
Pulmonary tuberculosis	1
	8

Table IIIc: Maternal deaths due to non-related causes

Causes	No.
Massive bowl gangrene	1
Mesenteric thrombosis	1
Carcinoma of larynx	1
	3

Table IV: Incidence of cases with avoidable factors among maternal deaths in Isfahan

	Causes of death	Total	With avoidable factors	With unavoidable factors
I	Direct Obstet.			
	Hemorrhage	5	5	–
	Septic shock	4	4	–
	Eclompsia	3	3	–
	Anesthesia	2	–	2
	Cerebr. hemorrhage	2	–	2
	Pulm. embol.	2	–	2
		18	12	6
II	Indirect Obstet.			
	Hepatitis	4	–	4
	Chron. Renal Dis.	3	–	3
	Pulm. Tbc.	1	–	1
		8	–	8
III	Non-related			
	Bowl gangr.	2	2	–
	Carcin. Larynx	1	–	1
		3	2	1
		29	14	15