Effect of Upgraded Emergency Services on Obstetric Case Fatality at a Tertiary Hospital in Cross River State, Nigeria

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Abstract
Context: Maternal mortality is still a major problem in sub-Saharan Africa. Majority of these deaths are however preventable.
Objectives: To assess the impact of the prevention of maternal mortality (PMM) programme carried out in the University of Calabar Teaching Hospital in 1994.
Materials and Methods*:* A retrospective analysis of maternal mortality records in the University of Calabar Teaching Hospital during the pre-intervention years (1992-1994) and the post-intervention years (1995-1997).
Results*:* There were 10,887 deliveries and 116 maternal deaths giving a maternal mortality ratio of 1,070 per 100,000 deliveries. The main causes of death were obstetric haemorrhage (25%), septic abortion (12.1%) and ruptured uterus (10.3%). These interventions were assessed as effective based on at least a 50% reduction in the case fatality rate (CFR) and were effective for obstetric haemorrhage (81.9% reduction in CFR, OR = 5.5), obstructed labour(80.5% reduction in CFR, OR =5.6), ruptured uterus (74.8% reduction in CFR, OR = 4) and eclampsia (54.2% reduction in CFR, OR = 2.2).
Conclusion*:* Access to prompt and affordable emergency obstetric care by all pregnant women will result in a reduction in our high maternal mortality rates.

Key Words: Obstetric Case Fatality, Emergency Obstetric Care

INTRODUCTION

The birth of a new baby is often celebrated around the world, yet in the developing world pregnancy and childbirth is often a perilous journey. The world Health Organization estimates that about 585,000 women die annually from maternal causes and ninety-nine percent of these deaths occur in the developing world, especially in sub-saharan Africa where the life time risk that a woman would die in child birth is 400 times higher than in developed nations.[1,.2]

Obstetric haemorrhage, particularly post-partum haemorrhage has been identified by many workers as one of the major causes of death in the developing countries.[2,3,4] Other major causes of death include infections, hypertensive disorders of pregnancy, obstructed labour and induced abortion [2,3,4]. The preventable nature of these deaths has also been emphasized [5,6,7]. Over 80% of these maternal deaths have been shown to be prevented by simple prophylactic measures, coupled with timely diagnosis and institution of adequate treatment of complications of pregnancy.[7]

Over the past decades, experts have advocated life saving strategies that are effective even in low resource setting [8]. In Nigeria however, more emphasis has been placed on building edifices which are often abandoned midway. Resources for basic maternity care/adequate health care are often scarce and even when available, the political will is either lacking or facilities are inequitably distributed. Thus simple interventions, which can improve the quality of health services at low cost, are advocated. The prevention of maternal mortality (PMM) programme was a collaborative effort between Columbia University Center for Population and Family Health and African research teams in Nigeria, Ghana, and Sierra Leone. It was sponsored by the Carnegie Corporation of New York. In Calabar, South-South Nigeria, haemorrhage and related conditions like obstructed labour and ruptured uterus were identified as the priority obstetric complications contributing to maternal death hence appropriate intervention were designed at the institutional level to cater for this. The purpose of this study is therefore to assess the impact of these interventions on the obstetric case fatality rate in the University of Calabar Teaching Hospital (UCTH), a tertiary institution in Cross River State of Nigeria.

MATERIALS AND METHODS

All the admission and discharge registers in the labour ward, antenatal, post-natal and gynecological wards, from January 1992 to December 1997 and case notes of all maternal deaths in the University of Calabar Teaching Hospital were retrieved and reviewed.

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Information extracted included, mode of all deliveries, major obstetric complications, case Fatality Rate (CFR) as well as admission to definitive treatment interval.

The case fatality rate (CFR) was used as an impact /outcome indicator for quality of care and was calculated as the number of deaths due to the complication divided by the total number of cases of the complication expressed as a percentage. It was assumed that effective interventions resulted in at least a 50% reduction in CFR. The odds ratio (OR) for each complication was then calculated.

PROBLEMS IDENTIFIED PRIOR TO INTERVENTION

- Patients with major obstetric complication were frequently found to have arrived too late in hospital.
- It was found that there was a marked delay of up to three hours before patients with obstetric complications especially haemorrhage were seen by an attending physician.
- The unavailability of senior physicians to carry out definitive treatment due to poor communication facilities and epileptic ambulance services
- There was only one functioning theatre in the maternity unit, thus there was no facility to carry out an emergency surgery during an ongoing elective case.
- The blood bank was often short of blood bags and this frustrated the efforts of the few voluntary donors who came to donate blood.
- Poor attitude of support staff (porters, ward maids, and anaesthetic technicians) to obstetric emergencies.
- Patient's medical records were poorly kept and extracting data was a Herculean task.

With these findings, phased intervention programmes were implemented. Emphasis was placed on programmes which were cheap, sustainable and replicable.

INTERVENTIONS:

These interventions were done in collaboration with the hospital management and were commenced in January 1994. The project assisted in the repair of a refrigerator in the blood bank and provided blood bags, reagents and bleeding sets. In April 1994, blood donation campaigns were started, campaign activities extended from the villages to major markets, schools and churches. The following interventions were also done:-

- The refurbishing of a second operating table and provision of an anaesthetic machine which facilitated the opening of the second theatre, adjacent to the labour ward.
- Refurbishing of sleeping-in rooms for doctors and anaesthetic nurses. This facilitated a compulsory sleep-in policy for residents while on call.
- Hospital workshops were organized to improve staff technical as well as communication skills.
- Training of staff in simple methods of data collection and improved record keeping.
- Facilitation of the introduction of the pre-costed operating pack system. This enabled the initiation of treatment from emergency care to definitive surgery without insistence on pre-operative cash deposit.
- Purchase distribution and training of senior residents and consultants on the use of the VHS walkie- talkie to facilitate emergency communication during off duty hours.

These interventions were largely completed by December 1994.

RESULTS

During the period under review there were 10,887 deliveries and 116 maternal deaths from pregnancy related causes giving a maternal mortality ratio of 1,070 per 100,000 deliveries. Ninety of these deaths (77.6%) were in the pre-intervention period and 26 deaths (23.4%) were in the post-intervention period.

There were 96 maternal deaths from recognized major obstetric complications while the causes of 20 deaths (17.2%) were not confirmed. Obstetric haemorrhage was the major cause of death accounting for 29 (25%) maternal deaths. Post-partum haemorrhage was responsible for 24 (20%) of these deaths. Other major causes were septic abortion (12.1%), ruptured uterus (10.3%), puerperal sepsis (10.3%) and obstructed labour (9.5%). (Figure i).

Eighty out of 89 obstetric deaths (89.9%) (excluding septic abortion and ectopic pregnancy) occurred among unbooked patients.

There were 1754 admissions of major maternal complications. Obstetric haemorrhage contributed 506 (28.8%) of these, followed by post-abortal complications 489 (27.9%), obstructed labour 392 (23.3%), ectopic pregnancy 187 (10.7%), eclampsia 96 (5.5%), postpartum sepsis 57 (3.2%) and ruptured uterus 39 (2.2%)

Table ii shows the case fatality rate (CFR) for each complication in the pre and post-intervention periods.

Assuming the effective interventions resulted in at least 50% reduction in CFR, these interventions were effective for obstetric haemorrhage (81.9%, OR=5.5), obstructed labour (80.5%, OR=5.6), ruptured uterus (74.8%, OR=4), and eclampsia (54.2%, OR=2.2). These interventions were least effective for puerperal sepsis (16.2%, OR=1.2), septic abortion (34.3%, OR=1.5) and ectopic pregnancy (45.7%, OR=1.8) (Table iii).

There was a reduction in the average admission to

definitive treatment interval among women with obstetric haemorrhage from an average of 2.7 hours in the pre-intervention years to 1.1 hours in post-intervention period.

Table 1: Causes Of Maternal Deaths

	PRE INTERVENTION			POST INTERVENTION			
COMPLICATION	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**TOTAL**
OBSTETRIC HAEMORRHAGE	10	7	7	2	1	2	29
OBSTRUCTED LABOUR	4	2	4	-	1	-	11
RUPTURED UTERUS	4	3	3	1	-	1	12
PUEPERAL SEPSIS	3	4	2	1	1	1	12
ECLAMPSIA	3	3	2	1	1	1	11
ECTOPIC PREGNANCY	2	1	2	1	1	-	7
SEPTIC ABORTION	4	3	3	1	2	1	14
UNKNOWN	5	4	5	2	1	3	20
TOTAL	**35**	**27**	**28**	**9**	**8**	**9**	**116**

Table 2: Case Fatality Rate For Each Complication

	PRE INTERVENTION			POST INTERVENTION		
COMPLICATIONS	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
HAEMORRHAGE	12.5	8.7	10.4	1.8	0.97	3
OBSTRUCTED LABOUR	4.7	2.6	5.1	-	2.2	-
RUPTURED UTERUS	50	42.8	50	11	-	25
POST - PARTUM SEPSIS	21.4	22.2	25	12.5	20	25
ECLAM PSIA	15	20	15.4	11.1	8.3	37.
SEPTIC ABORTION	29	3	4.2	1.6	3.5	1.7
ECTOPIC PREGNANCY	5	3.2	.3	3.4	4.2	-

Table 3: Percentage Reduction In Cfr And Odds Ratio

Complication	(AveCFR) Pre - intervention	(AveCFR) Post - intervention	Reduction	%	0R
haemorrhage	10.5	1.9	8.6	81.9	5.5
Obstructed labour	4.1	0.73	3.3	80.5	5.6
Ruptured uterus	47.6	12	35.6	74.8	4
Sepsis	22.9	19.2	3.7	16.2	1.2
Eclampsia	16.8	7.7	9.1	54.2	2.2
Septic abortion	3.5	2.3	1.2	34.3	1.5
Ectopic pregnancy	4.6	2.5	2.1	45.7	1.8

Table 4 : Admission to Definitive Treatment Interval Among Women With Obstetric Haemorrhage in Hours

	PRE INTERVENTION			POST INTERVENTION		
YEAR	1992	1993	1994	1995	1996	1997
AVERAGE INTERVAL	3.1	2.8	2.1	1.4	1.1	0.8
NO. OF CASES	80	79	67	110	103	67

DISCUSSION:

This review shows a maternal mortality ratio of 1,070 per 100,000 deliveries which was however much lower than 2,800/100,000 reported in Ilorin, Nigeria, 2700/100,000 in Enugu but similar to 1,050/100,000 reported in Zaria.[3,4] The percentage of the deaths due to obstetric haemorrhage was similar to the that found in Enugu.[4]

The predisposing factors that have been found to contribute to this high rate of maternal mortality in our environment, include the lack of awareness on the part of patients and their reluctance, or delay in seeking prompt emergency care in a health facility during obstetric emergencies , the lack of or the prohibitive cost of transportation which results in their very late arrival in the health facility and delay in institution of resuscitative measures in the hospital due to the non-availability of medical consumables, infrastructure, high cost of drugs and the non-availability of ready blood transfusion.[6,7,9,10,11]

The preponderance of the obstetric (89.9%) among unbooked patients was similar to other reports.[11] The positive influence of antenatal care on obstetric outcome cannot be over emphasized and has been stressed by many authors.[3,4,11]

This study also revealed a decrease in the number of maternal deaths, case fatality rates and reduction of the odds ratio for obstetric haemorrhage, obstructed labour , ruptured uterus and eclampsia in the post-intervention years when compared with the pre-intervention years.
The improvement in the quality of emergency obstetric care was also evident in the marked reduction in average admission to definitive treatment interval in the post intervention years. Life saving blood transfusions was more readily available in cases of obstetric haemorrhage and emergency obstetric surgeries were facilitated by the availability of pre-

costed surgical packs, an emergency theatre and personnel.

The least reduction in CFR occurred in patients with puerperal sepsis and septic abortions. The common factor in both cases was usually the very late arrival in hospital and sssinability of the patients to procure the required broad spectrum antibiotics, which were available in the hospital pharmacy only on a cash and carry basis.

Post abortal complications were the second most common complication encountered and were responsible for about 12.1% of the maternal deaths. In Nigeria, unsafe abortion is responsible for about 20,000 deaths annually.[12,13] Majority of these patients are single adolescents, usually discriminated against by family planning service providers.[13,14] Safe motherhood programs tend to lay emphasis on obstetric haemorrhage largely ignoring other major obstetric complications. If this trend is continued these other complications could eventually overtake obstetric haemorrhage as major causes of death. Interventions aimed at reduction of post abortal morbidity and mortality should be encouraged and post abortion care should remain an integral part of Emergency Obstetric Care.

Although hospital based, this study shows that simple and cheap intervention programs to improve emergency obstetric care can reduce maternal mortality. Making motherhood safe requires commitment at all levels, in the home, in the community and at national and international levels. Women will stop dying in childbirth when they are able to plan their pregnancies, give birth under the supervision of a skilled attendant, and have access to Emergency Obstetric Care if pregnancy complications occur.

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