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RESEARCH ARTICLE

AUDIT OF MATERNAL DEATHS AT THE TEACHING HOSPITAL OF COCODY

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ABSTRACT

Objective: To identify causes of maternal death and dysfunctions in patient management. **Methodology**: Retrospective and descriptive study, in the department of gynecology and obstetrics, which covered a period of 4 years (2014 to 2017). **Results:** In our study, the intra-hospital maternal mortality ratio was 665 per 100,000 live births. The average age of the deceased patients was 25 years. The majority were in the informal sector (46.7%) and without a profession (41.3%). The patients had an average parity of 2.5. At least 4 ANCs were performed in 47.6% of our patients who had been evacuated in 89.3% of the cases. Direct obstetrical causes were the most common (78% of cases vs. 22% for indirect causes). Hemorrhage accounted for 67.4% of direct obstetrical causes (and were dominated by haemorrhages in the immediate postpartum (50.8%)), followed by vasculo-renal syndromes (26.4%) and infections (6.2%). The deaths were mainly due to "3 delays" with, 89.3% of delay at the initial consultation. The dysfunctions found at the Teaching Hospital of Cocody were the lack of blood products and the unavailability of operating theaters which were permanently occupied. Maternal deaths were preventable in 91.3% of the patients in our study. **Conclusion:** In sub-Saharan Africa, dysfunctions in health services are most often responsible for most maternal deaths.

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INTRODUCTION

Maternal mortality is a public health issue. Every day around the world, more than 830 women die from complications during pregnancy, childbirth and the postpartum period. In 2015, the WHO estimated the number of maternal deaths worldwide at 303000 per year, of which 99% occurred in developing countries (Philip, 2016). Analysis of the circumstances in which these deaths occurred shows that they are preventable in almost all cases (Nayama et al., 2016; Dellagi et al., 2008). Analysis of the circumstances in which these deaths occurred shows that they are preventable in almost all cases (Nayama et al., 2016; Dellagi et al., 2008). Côte d'Ivoire is not on the fringes of this situation, as shown by its estimated maternal mortality ratio of 645 deaths per 100,000 live births in 2015 (Ministère de la santé et de l'hygiène publique, 2015). To address this situation, several strategies were put in place in services to reduce maternal deaths, including clinical audit. Our study aimed to contribute to the reduction of maternal deaths at the Teaching Hospital of Cocody through clinical audits.

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METHODOLOGY

This was a retrospective and descriptive study that took place at the gynecology and obstetrics department of the Teaching Hospital of Cocody, over a period from December 1, 2017 to November 30, 2018 (4 years). The study concerned all cases of maternal death as defined the WHO and which occurred or observed in the delivery room, the operating theaters, the intensive care unit and the gynecology emergency room at the Teaching Hospital of Cocody. Were not included in our study, maternal deaths occurring during transfer or before admission to the service; maternal deaths occurring within 05 min after admission to the service.

RESULTS

The frequencies : During our study, we recorded 185 maternal deaths over the 4 years. Over the same period, we recorded 27,984 deliveries for 27,799 live births. The intra-hospital mortality ratio was therefore 665 deaths per 100,000 live births. The number of deaths retained in the sampling is 150, the patients who arrived deceased and those who died within 5 minutes of admission to the number of 35 were not included in our study.

Epidemiological characteristics: The average age of our patients was 25 with extremes of 11 and 44 years. The nulliparous represented 22.7% and the primiparous 24.7%. The patients were unemployed or in the informal sector in 88% of cases.

Admission

Analysis of maternaldeaths

Period and cause of maternal death: Post partum was the main period of maternal death (62,67%)

Direct obstetrical causes of maternal death: Direct obstetrical causes accounted for 78% (n=117) compared to 22% (n=33) for indirect obstetrical causes. Direct obstetrical causes (n=117) :Hemorrhage accounted for 67.4% of direct obstetrical causeswere dominated by haemorrhages in the immediate postpartum (50.8%). Followed by vasculo-renal syndromes (26.4%) and infections (6.2%). The main indirect obstetrical causes (n=33) : anemia (39.4%), AIDS (21.2%), acute lung edema (6.1%) and sickle cell anemia (3%)

Dysfunctions

Responsibilities : The initial consultation time was more than one hour in 89.3% of the deceased patients. Responsibilities found: hospital administration (70/150) and hospital staff (31/150)

Preventabledeaths : Maternal deaths were considered preventable in 91.3% of cases.

DISCUSSION

Frequencies: The maternal mortality ratio in our study was 665 deaths per 100000 live births. It is low compared to 2012 figures in the Adjoby study (2145 deaths per 100000 live births) (Adjoby, 2012) and 2013 in the Effoh study (1017 per 100000 live births) (Effoh, 2015) in the same department. This is probably partly related to the way in which the various studies are recruited. When analysing the literature, this rate was close to that of Ousmane, which was 615.8 deaths per 100000 live births in Senegal in 2014 (Ousmane, 2014). It is well above that of Elhassande in Sudan which was 442 per 100000 live births in 2009 (Elhassan, 2009). Elsewhere in France, Deneux (Deneux, 2017) recorded 10 deaths per 100000 live births in 2012. Note that in developed countries, maternal mortality ratios are considerably lower than in developing countries.

Epidemiological characteristics: In our study, the average age of deceased patients was 25 years with extremes of 11 years and 44 years. The majority of deceased patients were 30-34 years of age (29%). This average age is close to that of Boubacar et al. (2019) in Conakry; as well as that of Ouattara in Ouagadougou (Ouattara, 2017) who found an average age of 26 years. These were young patients, as described in the African literature, this age group represented the age of excellence of motherhood in relation to early unions and sexual intercourse, associated with low contraceptive prevalence (Adjoby, 2012; Effoh, 2012). In the West, and particularly in France, the age group most affected by maternal deaths is between 30 and 39 years of age, with an average age of 33 years (Deneux, 2012). This difference is explained by the average age of onset of the first pregnancy which is later. In addition to this, there is a contraceptive prevalence and a higher level of education. However, in Côte d'Ivoire contraceptive prevalence increased from 14% in 2012 to 23% in 2018 (Effoh, 2015). The majority were from the informal sector in 46.7% and without occupation in 41.3% of cases. These results are similar to those of Adjoby where the deceased patients were without a profession in 54.7% of cases (Adjoby, 2012). One could conclude at a low socio-economic level among these patients. Despite the policy of free emergency obstetrical and neonatal care at the Teaching Hospital of Cocody, the reality is quite different on the ground. Rather, it was an emergency obstetrical and neonatal care subsidy that generated more attendance at the Teaching Hospital of Cocody, with the corollary being a delay in management and excessive consumption of inputs. According to the literature, maternal deaths most often involved poor patients with a low socio-professional level (Dellagi et al., 2008 ; Adjoby, 2012; Effoh, 2015).

The maternal mortality ratio was high in primiparous (24.7%) and nulliparous (22.7%). Our results were close to those of N'guessan (N'guessan, 2010). Our patients had in 47.6% of cases performed at least 4 antenatal consultations (ANC), these were considered to be well followed. There were 4.8% of deceased patients who did not have an ANC book, so they had not been followed. Poorly followed patients also represented 47.6% of cases. Elsewhere, Luhete in the DRC (Luhete, 2017) found, unlike us, 80.5% of poorly followed ANC and 31.8% not followed.

Evacuation conditions: The evacuated patients were the patients who died the most in our study with a rate of 89.3%, which is close to that of Effoh 80.8% (Effoh, 2015). Our evacuated patients were most often in precarious condition, as our numbers show. This finding is partly related to the long lead time and delay to evacuation as described in the literature (Dellagi, 2008; Adjoby, 2012; Boubacar, 2019; N'guessan, 2010). Even for patients who had received an ambulance transfer, the risk was still there because the ambulances were not medicalized. All of these factors accounted for the death of 18.9% of women within one hour of their admission to our study.

Analysis of maternal deaths: Direct obstetrical causes accounted for 78% of maternal deaths in our study. Ousmane noted 80% of direct obstetrical cause at the Regional Hospital centre of Ndioum in Dakar in 2014 (Ousmane, 2014). When Foumsou noted 75.7% in N'Djamena (Chad) in 2014 (Foumsou, 2014). Recall that worldwide the WHO reports 75% to 85% of direct causes (Effoh, 2015). The direct obstetrical causes in our study were mainly represented by bleeding. This high rate of maternal haemorrhage death during our study period was mainly related to late medical evacuations, insufficient operating theater and unavailability of blood products. Of the hemorrhagic causes, more than half were related to the immediate postpartum hemorrhage (50.8%). This rate is close to that of Issa in Burkina Faso (48.8%) (Issa, 2017). Regarding hypertensive complications (26.4%), which represented the second direct obstetrical cause in our study. They are due to poor antenatal follow-up and difficulties in accessing emergency obstetric care. Infectious causes ranked third in our series with a rate of (6.2%). Ten years ago, some authors classified them as the second direct

Table 1. Distribution of patients according to the characteristics at admission

Characteristics		FREQUENCY	PERCENTAGE
Number of ANC	0	6	4,76
	1	8	6,35
	2−3	52	41,27
	≥4	60	47,62
Mode of admission	Evacuated	134	89,33
	Reffered	4	2,67
	Comingfromherself	12	8
Evacuation mode	Ambulance	58	43,28
	Others	76	56,72
Evacuation time ≥ 1H		108	80,59

Table 2. Distribution of patients by period of death

Period of death	FREQUENCY	PERCENTAGE
Post abortum	4	2,66
Pre partum	21	14
Per partum	31	20,67
Post partum	94	62,67
Total	150	100

Post partum was the main period of maternal death (62,67%)

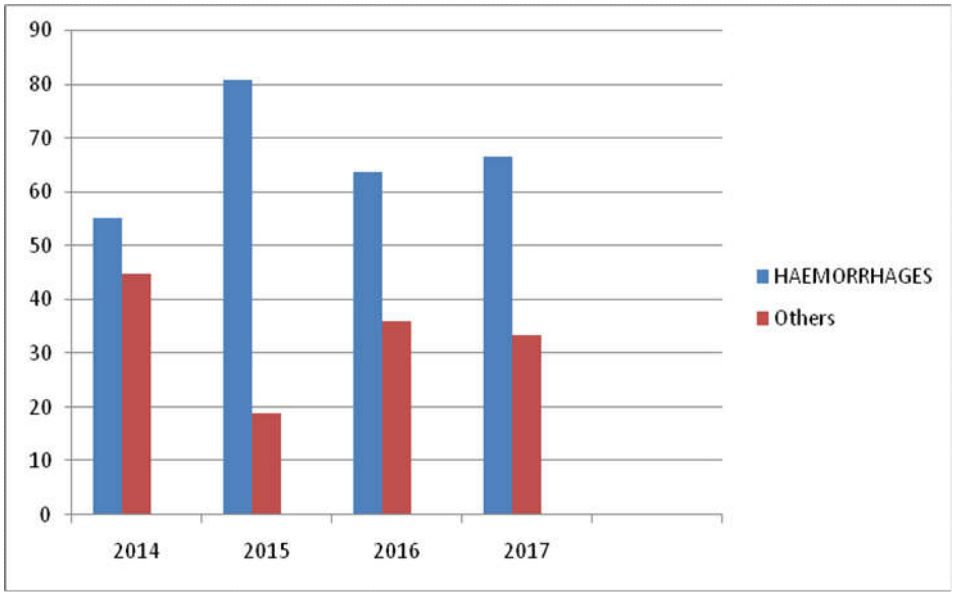

Figure 1. Distribution of patients by direct obstetrical causes

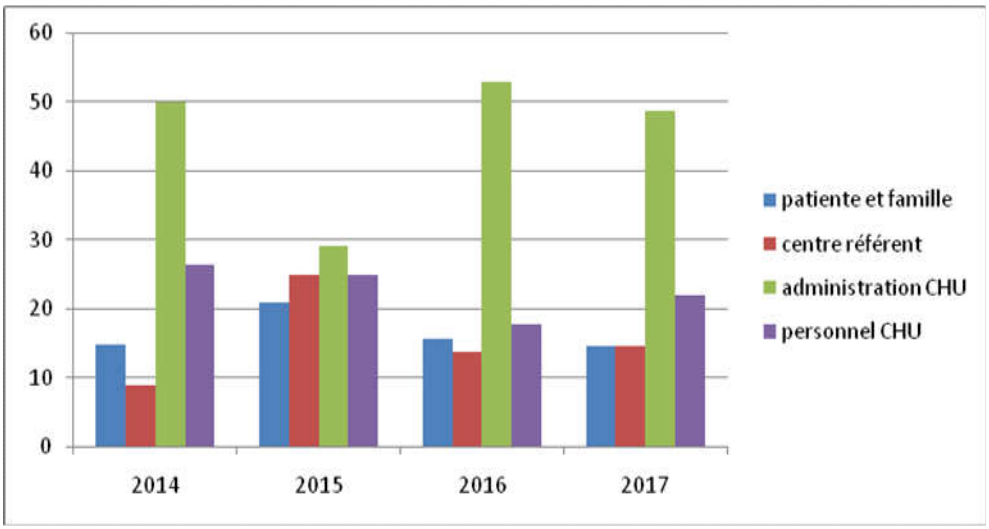

Figure 2. Distribution of maternal deaths by responsibilities

obstetrical cause (Saizonou, 2006). This decrease in infection was possible thanks to a systematic antibiotic coverage. Indirect obstetrical causes accounted for (22%) of the causes of death in our study. They were mainly represented by acute lung edema (6.1%), anemia (39.4%) and AIDS (21.2%). Our results were similar to those of Ouattara in Congo which found 50% for anemia (Ouattara, 2017). In our study we noted a very high death rate in post partum with 62.7% of cases. According to the WHO, a woman who bleeds in the postpartum has two hours to die.

Dysfunctions: The analysis model proposed by the WHO is that of the "3 delays". In our study, files analysis revealed that 89.33% of these patients did not receive their initial consultation within a reasonable time. Our figures are close to those of Effoh (Effoh, 2015) who noted 77.11% delay in the initial consultation. The reasons given for this delay in the consultation were: the patient's ignorance of the warning signs and her family 79.24%; the family's lack of financial means 15.38% and the lack of means of transport 5.38%. The second delay in accessing health centres, once the decision was made, is of little relevance to our study. This delay would be due to financial constraints, the lack of means of transport and the state of the roads.

The third delay occurs at two levels. First of all at the reference centre, this is the delay in evacuation which is found in 80.59% of the deaths. It is mainly the responsibility of the staff with whom the decisions of medical evacuations were late, but also of the patient's parents who are subject to financial constraints, and finally to the lack of ambulance in some health centres. The delay in evacuation would explain the fact that in our study 18.9% of patients died within an hour of admission. The lack of beds available in the intensive care unit remains a determining factor. This is the case of comatose eclamptics which could not be admitted for intensive care. The delay in surgical management with an average delay of 2H15mn as pointed out by Loué in the same department, contributed to aggravate the maternal prognosis (Loué, 2015). However, Bouvier-Colle did not attribute an important role to the financial power of patients. This is due to the fact that in France patients are covered by social security (Bouvier-Colle, 2003).

Preventable death concept: Preventable death is the fatal outcome that should not have happened if health technology, appropriate to the nature of the disease and the level of care, had been properly applied. In our study 91.3% of the deaths were judged to be preventable, this figure can be superimposed on that of Effoh (92.3%) (Effoh, 2015). Adjoby found 96.2% of deaths preventable and Horo 98% at the Teaching Hospital of Yopougon (Adjoby, 2012; Horo, 2008). According to the WHO, more than 80% of maternal deaths are preventable.

Conclusion

The ratio of maternal mortality at the maternity ward of the Teaching Hospital of Cocody remains high. The epidemiological profile of deceased women was that of women who were mostly evacuated under inadequate conditions and arrived in precarious conditions. In sub-Saharan Africa, these deaths were preventable in almost all cases, and the dysfunctions of health services are responsible. The review of maternal deaths in the form of joint staff could allow a certain awareness of the different actors involved in care.

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