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Dysfunctions in the Management of Severe Preeclampsia in a Second-Level Referral Hospital (Parakou/Benin)

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Abstract

The study focused on the management of severe preeclampsia. It was an operational research conducted as a clinical audit based on criteria that aimed to identify shortcomings in the management of severe preeclampsia (SPE). At the end of this study, it appeared that severe preeclampsia accounted for 5.6% of deliveries. The mean age of the patients was 25.5 ± 6.5 years and the latter were especially nulliparous (47.8%). Dysfunctions were identified at all stages of care: referral (25.85%), initial assessment (30.95%), patient biological monitoring and treatment monitoring with magnesium sulfate (58.8%). To address those shortcomings, a close collaboration is necessary between the laboratory, the gynecology and obstetrics unit and the hospital managing team.

Keywords: Dysfunction; Severe preeclampsia; Audit; Criteria

Introduction

According to the World Health Organization (WHO), preeclampsia and eclampsia are leading causes of maternal morbidity and mortality with 20% of deaths [1]. The optimization of health care which aims to prevent and treat hypertensive disorders in pregnant women is a necessary step for the achievement of the millennium development goals [2]. This is the context in which this study is initiated in order to identify dysfunctions in the management of severe preeclampsia (SPE) and to apply to them corrective actions in a second-level referral maternity in Benin.

Materials and Method

Study setting

The gynecology and obstetrics unit of Borgou Regional Hospital (CHD/B) was the setting where this research work had been carried out. It is the referral unit that attends nearly all obstetrical emergencies of the District of Parakou and its surroundings (1910 referrals in 2011). It had a capacity of 68 beds and performed about 2850 deliveries per year. As well, it was staffed with four physicians who fulfill on-call duties of 2 days each. Furthermore, there were 16 midwives including 12 assigned to the delivery room; the latter carry out on-call duties of 12 hours.

Audit method

It was an operational research conducted as a clinical audit based on criteria regarding all SPE cases attended in the CHD/B gynecology and obstetrics unit during the period from January 1, 2011 to December 31, 2012. It was based on the examination of the records of pregnant women suffering from SPE.

Study population

It consisted of pregnant women, newly-delivered women and parturients (women who had recently given birth) who were admitted in the gynecology unit for high blood pressure.

Sampling

Sampling was exhaustive and sample size was calculated by means of SCHWARTZ formula.

Inclusion criteria

Inclusion criteria**:** The study involved pregnant women, parturients or newly-delivered women with [1].

- Preeclampsia with at least one of the following criteria.
- SAP ≥ 160 mmHg and/or DAP ≥ 110 mmHg and/or a significant Grade 2+ dipstick proteinuria and/or
- A maternal complication of SPE :
- Eclamptic crisis,
- Chronic neurological disorders (headaches, visual impairments, polykinetic osteotendinous reflexes (OTRs))
- Placental abruption or fetal impact,
- HELLP syndrome or epigastric pain in the forehead,
- Acute pulmonary edema, cerebrovascular accident (CVA),
- Renal failure : oliguria < 500 ml/ 24 hours, or creatininemia > 135 µmol/L, or proteinuria > 3 g/ 24 hours or ≥ 3+

Non-inclusion criteria

- Mild preeclampsia (DAP higher than 90 mmHg, while remaining lower than 110 mmHg, with proteinuria rising up to 2+, < 3.5 g/24h).

Exclusion criteria

- Female patients with unusable medical records: lack of information for care provision.

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The Table 1 translated the Criteria for the assessment of care quality.

Evaluation criteria

We had considered as dysfunction any action identified as not meeting by 100% the criteria.

Dysfunctions had been identified according to patient's therapeutic path from her referral, then on her admission until her discharge from hospital.

Data collected

Data collection was spread over a period of eight weeks. Data had been gathered with survey sheets/forms, consultation registers and medical records.

The study variables were: referral, time limit for care, treatment with sulfate magnesium, antihypetensive treatment, time of uterine evacuation; clinical monitoring, biological monitoring).

Data analysis

The procedure consisted of data retrieval from medical records, data aggregation and determination of percentage of SPE cases who received care and meeting the approved criteria. Data were processed and analyzed with version 3.5.1 of EPI-INFO 2008 software.

Results

Sociodemographic characteristics of patients

During the study period, 6.403 pregnant women were admitted in the CHD/B gynecology and obstetrics unit and 4.456 deliveries were performed. Among those female patients we counted 230 SPE cases i.e. 3.59% of the pregnancies and 5.6% of the deliveries.

The age of patients suffering from SPE was between 15 and 43 years. Their mean age was 25.5 ± 6,5 years. Patients aged 20-34 years were the most numerous with a frequency of 64.7%.

They were nulliparous (0 delivery) more often with 110 cases (47.8%), then primiparous (1 delivery) with 42 cases (18.3%) and pauciparous (2 to 3 deliveries) with 40 cases (17.39%). There were 38 cases (16. 52%) of multiparous patients (4 to 6 deliveries) and grand multiparous (beyond 6 deliveries).

Dysfunctions

They were related to referral and in-hospital care which totaled 1292 dysfunctions distributed as follows: (Tables 2-4).

The table II translated the distribution of dysfunctions associated with referral conditions (Table 2). In total, 334 dysfunctions had been registered in the context of referral (25.85%).

On admission, the average time limit for initial assessment was 10 mn ± 2 mn with extremes ranging from 5 mn to 35 mn.

The table III translated the distribution of patients according to their initial assessment (Table 3). 400 dysfunctions (30.95%) were noted in the context of initial assessment.

Dysfunctions associated with treatment and to its monitoring

Among the 230 colligated severe preeclampsias there were 44 eclampsias (19.13%) and 147 female patients (63.91%) had received $MgS0_4$. Uterine evacuation happened within the required time in 155 patients (67.39%) with respectively 121/186 (63.97%) in case of

Applicable standards	Criteria applied
REFERRAL	
• The patient must be accompanied by a survey form • The referral reason must be specified • The referral must be conducted under medical supervision • The referral center must be alerted	• A survey form accompanied the patient • The referral reason is specified • The referral is conducted under medical supervision • The referral center is alerted
CARE PROVISION	
• The initial assessment of blood pressure (BP), pulse, temperature, respiratory rate, state of consciousness, diuresis, dipstick proteinuria and coagulation must be carried out within 15 mn after admission	• The initial assessment of blood pressure (BP), pulse, temperature, respiratory rate, state of consciousness, diuresis, dipstick proteinuria and coagulation is carried out within 15 mn after admission
• Diagnosis must be made within 15 mn following admission	• Diagnosis is made within 15 mn following admission
• The indicated antihypertensive drug (Clonidine) must be administered within 30 mn following admission	• The antihypertensive drug (Clonidine) is administered within 30 mn following admission
• Magnesium sulfate must be administered within 30 mn following admission according to protocol	• Magnesium sulfate is administered within 30 mn following admission according to protocol
• Delivery must be performed within 24 hours in accordance with diagnosis in the absence of eclampsia crisis	• Delivery is performed within 24 hours in accordance with diagnosis in the absence of eclampsia crisis
• Delivery must be performed within the 12 hours following diagnosis in the case of eclampsia	• Delivery is performed within the 12 hours following diagnosis in the case of eclampsia
MONITORING	
A monitoring sheet must be drafted for all patients • Constants such as BP, Pulse, Temperature must be taken every 30 mn • Diuresis, reflexes, respiratory rate must be assessed every hour • A monitoring sheet is drafted for all patients • Constants such as BP, Pulse, Temperature are taken every 30 mn • Diuresis, reflexes, respiratory rate are assessed every hour Criteria developed based on the WHO guidelines: management of complications in pregnancy and delivery [2].	

Table 1: Criteria for the assessment of care quality.

Referral conditions	Level of criteria compliance		Dysfunctions	
	Proportion	Percentage	Proportion	Percentage
Referral reason specified	162/165	98.20%	3	1.80%
Referral sheet	145/165	87.80%	20	12.20%
Medical transport	19/165	11.50%	146	88.50%
Referral center alerted	00/165	0%	165	100%

Table 2: Distribution of dysfunctions associated with referral conditions.

Initial assessment	Level of criteria compliance		Dysfunctions	
	Proportion	Percentage	Proportion	Percentage
Respiratory rate	13/230	0.05%	217	94.34%
Albuminuria	220/230	95.65%	10	4.35%
State of consciousness	152/230	66.08%	78	33.92%
Coagulation test	135/230	58.69%	95	41.31%

Table 3: Distribution of patients according to their initial assessment.

	Level of criteria compliance		Dysfunctions	
	Proportion	Percentage	Proportion	Percentage
Treatment				
Treatment with MgSO4	147/230	63.91	83	36.09
Antihypertensive treatment	222/230	96.52	08	3.48
Uterine evacuation	155/230	67.39	75	32.61
Monitoring after treatment				
BP, Pulse, Temperatures	195/230	84.80	35	15.20
Signs of MgSO4 poisoning	3/147	2.04	144	97.95
Biological results	27/230	11.73	213	92.70g

Table 4: Dysfunctions during treatment and monitoring.

isolated SPE against 34/44 (77.27%) in case of eclampsia. The levels of dysfunctions registered are listed in Table 4.

The number of dysfunctions registered during in-hospital management of severe preeclampsia was 958. Treatment and monitoring totaled 558 (58.24%).

Discussion

The clinical audit based on quality criteria provides the benefit of systematic evaluation of care provision. As audit lies on those criteria, it is easier to demonstrate objectivity to identify problems [3]. It enabled us to point out all shortcomings in SPE management in the gynecology and obstetrics unit. The only limit of this research work is that the lack of systematic documentation of actions performed may have contributed to increase the number of dysfunctions for in principle any undocumented criterion is considered as a dysfunction [4].

Socio demographic characteristics

Over a period of 2 years from January 1, 2011 to December 31, 2012 SPE frequency was 5.16% in the CHD/B. This rate is on the rise in comparison with the estimate of 4.7% [4] found by a former study conducted in 2011 in the same unit. That increased SPE frequency is the result of an increase in the number of referrals with the creation of an intensive care unit which attends all the main complications in the northern region of Benin.

The age groups comprised between 20 and 34 years (64.7) and nulliparous were the most concerned with severe preeclampsia. The study conducted by Sibai [5] in the United States had noted a proportion of 75% of those aged from 20 to 34 years in 1995. Beaufils [6] had found out that parity and 20-35 year age group were risk factors for preeclampsia.

Dysfunctions

During our study, 1292 cases of dysfunction had been identified for 230 preeclampsias, i.e. about 6 dysfunctions by preeclampsia. The importance of dysfunctions suggests us a poor quality of care administered in the context of preeclampsia management in the unit. It reveals a lack of compliance with standards and protocols. As Touré had already noted, those dysfunctions were encountered at all stages of care [7]: from referrals (25.85%) through initial assessment (30.95%) and treatment (12.84%) till monitoring (30.44%).

Referrals suffered from lack of medical transport due to the absence of ambulance meeting the standards and even if it existed there was not always a skilled staff for support. Hence, intensive care and resuscitation measures during the transport are not adapted to the patient's condition. For this reason, the patient got to the referral center almost always in a precarious hemodynamic condition.

In any case the referral center was informed of the patient's arrival and thus it did not take any specific measure. The mean time of initial assessment was 10.41 ± 2 minutes. That celerity of care is altered by the lack of assessment of some vital functions such as respiratory rate, state of consciousness and bed-side coagulation test of the patient. The uterine evacuation happened within 24 hours in 67.32% of the cases. That time of uterine evacuation was more kept in case of eclampsia than when isolated severe preeclampsia (34/44: 79.29% against 121/186: 63.97%) occurred. Beyond compliance with principles, other motivations required uterine evacuation. Therefore, when pregnancy comes to its end or when it is close to its end and when the fetus is alive, fetal extraction occurred earlier. On the contrary, when the fetus is dead or when there is a risk for great prematurity while maternal condition is under control, fetal extraction occurred no more within a period of 12 hours in case of eclampsia or within 24 hours in case of isolated severe preeclampsia as recommended by WHO [2]. Anyway, it is recommended to not take inappropriate and excessive risks for the mother and termination of pregnancy depended on time limit and if a severe preeclampsia occurs earlier during pregnancy (some scientists set the time limit to 23 weeks), the pregnancy should be terminated [8-10].

In the treatment phase, three female patients out of four had benefitted from $MgSO_4$ administration recognized as the best treatment for severe preeclampsias [9]. For the remaining 25%, the non-use of magnesium sulfate was due to stock shortages at the hospital pharmacy or because the nursing team should continue the treatment with diazepam started before the referral as prescribed by protocols. To avoid that situation, it is important to provide the peripheral health facilities with $MgSO_4$ stocks by recommending at this level the administration of loading doses (LDs) before the transfer of patients.

Monitoring is the level at which the most serious dysfunctions appear. There is hardly any monitoring of diuresis, reflexes and respiratory rate. A particular emphasis is put on the necessary monitoring of those parameters without which there is a high risk of ignoring the signs of poisoning from Magnesium sulfate [8].

Biology which should support care was hardly available. That unavailability is due to two factors. These are the fact that patients lack financial resources and the non-performance of some analyses as emergency issues. There is need to review this result and negotiate with the laboratory and the hospital managing team so that this

minimum result could benefit from subsidy and special exemption for its implementation in the case of emergency.

Conclusion

SPE management suffered from non-compliance with protocols, drug stock-outs and lack of monitoring of treatment with $MgSO_4$ and biological treatment. Those dysfunctions could be corrected only in the context of cooperation between the clinician, the laboratory and the hospital managing team members.

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