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Prevalence of Neonatal Resuscitation in Yaoundé-Cameroon

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ABSTRACT

Aim: To determine the prevalence of neonatal resuscitation in two hospitals of Yaoundé in Cameroon

Methods: A retrospective cross-sectional study was conducted for seven months ranging from 18 October 2021 to 18 May 2022 in two hospitals of Yaoundé. Admission files of new-borns who benefited from neonatal resuscitation at birth from the year 2015 to 2020 were included. We recorded the socio demographic variables of the children's mothers (age, level of education et region of origin) and the clinical characteristics of new-borns (gestational age, gender, birth weight, Apgar scores) in an operating sheet. The results were analysed using IBM SPSS.23.0 software and the data expressed as frequencies percentages, and means.

Results: The main maternal age ranged between 25 to 30 years (28,9%). The mean age being 29.9 ± 5.8 years with extremes values of 15 and 42 years. Concerning the level of education, most had a secondary level (37.8%). There was a predominance of mothers from the Center region (38.5%). Most of the newborns were born at term (61.6%). The mean gestational age at delivery was 36.7 ± 3.6 WA with extreme values of 25 and 46 WA. The male gender was the most represented with 55% of the cases giving a sex ratio of 1.25. More than half of these babies had a birth weight between 2500 et 4000 grams (62.4%). The mean birth weight was 2748.4 ± 794.3 grams with extreme values of 800 and 5600 grams. The global hospital prevalence of neonatal resuscitation was 3.5%.

Conclusion: Term new-borns of male gender were most affected. The overall hospital prevalence and prevalence per health facility was low.

Keywords
Prevalence, Neonatal resuscitation, Cameroon.

Introduction

Neonatal resuscitation is a means to restore life to a baby from the state of asphyxia [1]. It is a highly effective intervention that should be initiated for all non-macerated new-borns who are not breathing spontaneously following immediate cry as stated by the World Health Organisation [2]. The goals of neonatal resuscitation are to prevent the morbidity and mortality associated with hypoxic ischaemic tissues (brain heart kidney) injury and to establish adequate spontaneous respiration and cardiac output. Of the 136 million births annually worldwide, an estimated 10 million will require some level of resuscitation [3]. Birth asphyxia is the main cause of neonatal resuscitation and accounts for one fourth of neonatal mortality [1,3]. In sub Saharan Africa, birth asphyxia brought 280000 deaths of new-born in the first day of life [4]. In Cameroon, the frequency of birth asphyxia remains high despite the implementation of neonatal resuscitation guidelines with 16% of neonatal mortality due to this condition [5]. The aim of this article was to determine the prevalence of neonatal resuscitation in two hospitals in Yaoundé.

Methods

A retrospective cross-sectional study was conducted for seven months ranging from 18 October 2021 to 18 May 2022 in two hospitals of Yaoundé (Gynaecology obstetrics and paediatrics hospital, Health center Nicolas Barre). We included admission files of new-borns who benefited from neonatal resuscitation at birth from the year 2015 to 2020. 245 patients were enrolled. The data were collected in patients' files recruited for the purpose of a thesis of medicine entitled "Medico-legal aspects of neonatal resuscitation in two hospitals in Yaoundé". The information was recorded in an operating sheet which included the clinical characteristics of new-borns (gestational age, gender, birth weight, Apgar scores) and the socio demographic variables of the children's mothers (age, level of education et region of origin). All data collected were kept confidential; only investigators had access to anonymous patient data. Incomplete files were excluded. Prior to this research, we obtained the administrative authorizations of all the hospitals selected and the ethical clearance of the ethics committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I.

Results

Mother's socio-demographic characteristics

The main maternal age ranged between 25 to 30 years (28.9%). The mean age being 29.9 ± 5.8 years with extremes values of 15 and 42 years. Concerning the level of education, most had a secondary level (37.8%). There was a predominance of mothers from the Center region (38.5%) (Table 1).

Table 1: Mother's sociodemographic characteristics (N=245).

Variables	Frequency	Percentage (%)
Mother's age groups (in years)		
[15-20]	16	6.5
[20-25]	26	10.6
[25-30]	73	29.8
[30-35]	68	27.8
[35-40]	56	22.9
[40-45]	6	2.4
Mother's level of education		
None	17	6.9
Primary	82	33.5
Secondary	91	37.1
Higher	55	22.4
Mother's region of origin		
Center	95	38.8
West	85	34.7
South	16	6.5
North	12	4.9
East	11	4.5
Littoral	10	4.1
Nord-West	9	3.7
South-West	5	2.0
Adamaoua	1	0.4
Far North	1	0.4

Clinical characteristics of the newborns

Most of the newborns were born at term (61.6%). The mean gestational age at delivery was 36.7 ± 3.6 WA with extreme values of 1.25 and 46 WA. The male gender was the most represented with 55% of the cases giving a sex ratio of 1.25. More than half of these babies had a birth weight between 2500 et 4000 grams i.e. 62.4%. The mean birth weight was 2748.4 ± 794.3 grams with extreme values of 800 and 5600 grams (Table 2).

Table 2: Clinical characteristics of newborns at birth.

Variables	Frequency	Percentage (%)
Age at delivery (Weeks of amenorrhea)		
< 28	7	2.9
[28-32]	18	7.3
[32-35]	36	14.7
[35-37]	33	13.5
≥ 37	151	61.6
Term at delivery		
Prematurity (< 37 WA*)	94	38.4
At term (≥ 37 WA*)	151	61.6
Gender		
Male	136	55.5
Female	109	44.5
Birth weight (grams)		
< 1000	4	1.6
[1000-1500]	11	4.5
[1500-2000]	29	11.8
[2000-2500]	39	15.9
[2500-4000]	153	62.4
≥ 4000	9	3.7

Neonatal resuscitation hospital prevalence

Global hospital prevalence

During the 3 years and 2 months of our study period, 13423 births and 466 cases of neonatal resuscitation were registered. The global hospital prevalence was 3.5%.

Hospital prevalence per health service

Case of the Yaoundé gynecology obstetrics and pediatrics hospital

The hospital prevalence of neonatal resuscitation at YGOPH during the study period was 2.9%. The figure below shows the neonatal resuscitation frequency distribution flow per month and per year.

Figure 1 shows that during the 3 years of study period, a falling peak of neonatal resuscitation was observed in the month of May.

Case of Health Center Nicolas Barré

Concerning the health center Nicolas-Barré, the hospital prevalence of neonatal resuscitation during the study period was 4.3%. The neonatal resuscitation frequency flow distribution per month and per year is represented in figure 3 below.

Figure 2 shows that from the month of May during 2020 and 2021 respectively, we observe a mild quiescence and a decrease of neonatal resuscitation frequency; then a rapid increase after May evolving in a saw tooth pattern till the month of November.
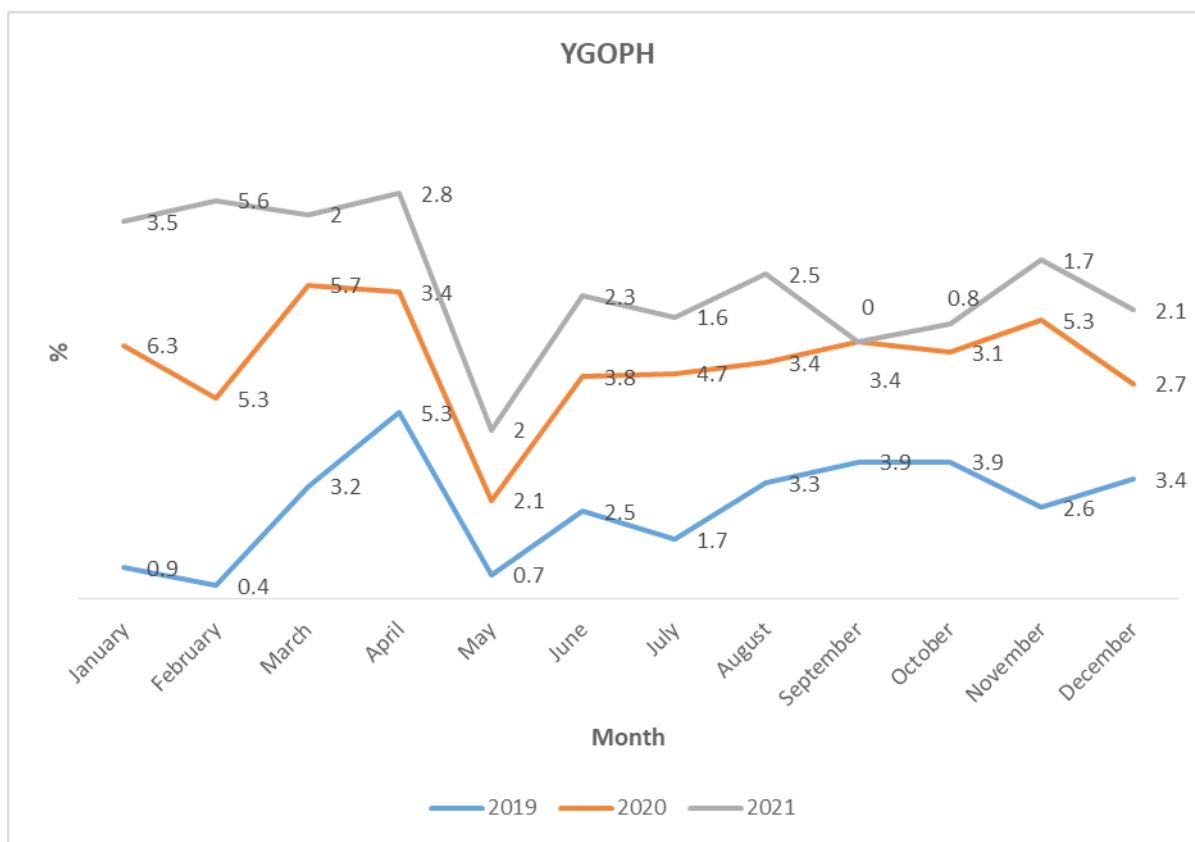
Figure 1: Neonatal resuscitation frequency distribution per month and per year in YGOPH.
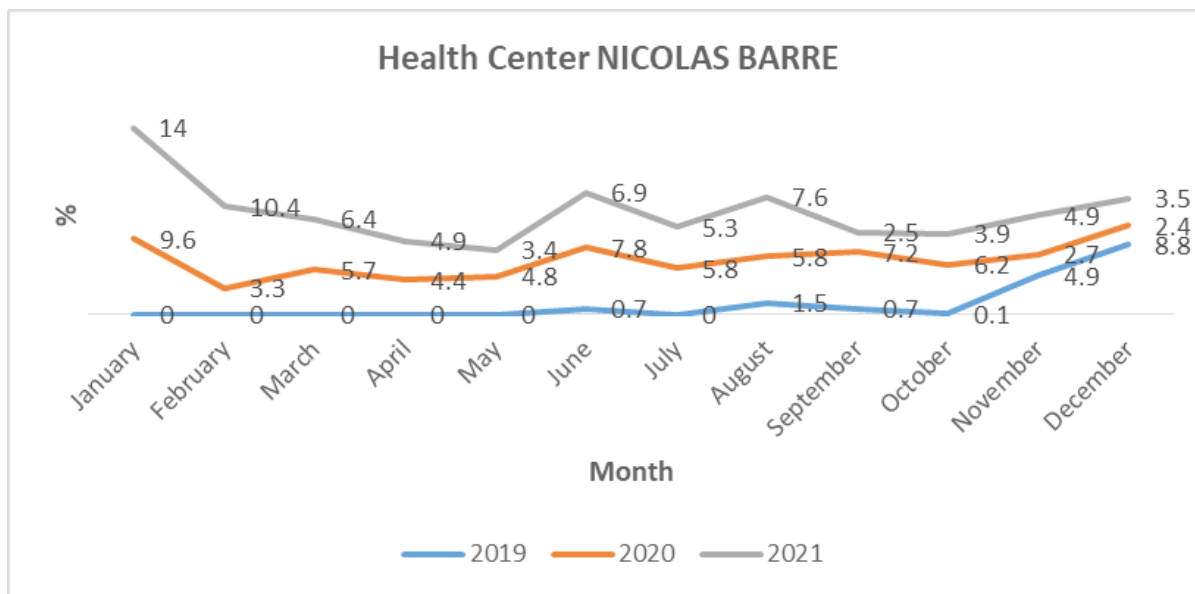

Figure 2: Neonatal resuscitation frequency flow distribution per month and per year in Health Center Nicolas-Barré.

Discussion

The maternal mean age of our study was 29.9 ± 5.8 years. This result might be confirmed by the fact that the prevalence of fertility in Cameroon is reported to be higher in the age group ranging from 25 to 29 years [6]. A similar mean age 25.7 (SD ± 5.86) years was reported in a study carried out by Bayih et al. in north central Ethiopia in 2020 [7]. This similarity could be explained by the fact there is a decrease of the egg quality and quantity in women aged mid-to-late 30s [8] Secondary level of education was the most common (37.8%) which was followed by primary level 33.5% and higher level 22.4%. This result was consistent with that found by EDSC-V Cameroun 2018 where secondary level education was the

most common among participants (33.2%), followed by primary level 12.9%, higher level 11.7% [6]. Most of the mothers were from the Center region (38.5%). This result is different from the demography of Cameroon where most women were from North region (6.2%) [6]. This mismatch could be explained by the fact that our study was carried out in the Center region essentially so most of the participants were from this region.

The mean gestational age at delivery in our study was 36.7 ± 3.6 WA and implied that most of the children of our cohort were born at term. This result matches with the data reported by Mansour Ghanaie et al. in the north of Iran where the mean gestational age was 37.27 ± 2.78 WA. This low proportion of preterm babies is consistent with the prevalence of prematurity in Cameroon reported by WHO (15%). The mean birth weight in our study was 2748.4 ± 794.3 grams and reflected the normal standard mensuration's of Cameroonian babies at birth [6]. Likewise, similar results were reported in Iran and in Central Ethiopia [7,9]. These similarities could be attributed to the fact that the various studies where carried out on term newborns hence birth weights ≥ 2500g.

We found a 3.5% global neonatal resuscitation prevalence in the two hospitals of our study from January 2019 to February 2022 which was about 3 times lesser than the prevalence reported worldwide of 10% [10]. This discrepancy in the results could be attributed to the fact that our study population was young (25-29 years) and literature reported advanced maternal age (>35years) as a risk factor of neonatal resuscitation. Neonatal resuscitation prevalence in YGOPH and health center Nicolas Barre was 2.9% and 4.3% respectively and a falling peak of resuscitation was observed in the month of May in both hospitals. No explanation could be found to justify this result.

Conclusion
The newborns in our study were mostly of male gender with normal gestational age and birth weight. The mean age of mothers in our study was 29.9 ± 5.8 years and the majority of them had secondary level of education and were from the Center region. The overall hospital prevalence and prevalence per health facility was low

Conflicts of Interest
The authors declare no conflicts of interest regarding the publication of this paper.

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