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Inequalities in maternal health and pregnancy outcome among Nigerian women migrated to Italy

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Abstract

Among migrant women, unfavourable health conditions and adverse obstetric events are observed more often than in native-born parturients. This observational retrospective study evaluated selected pregnancy outcomes in a Nigerian population giving birth at the University Hospital of Verona. Compared to national controls, being Nigerian was associated with preterm birth (aOR 1.6, 95% CI 1.1-2.2) and Cesarean section (aOR 2.2, 95% CI 1.5-2.7). No differences were found in rates of instrumental delivery and the immigrant group had half the risk of genital tears (aOR 0.6, 95% CI 1.1-2.2) with a higher likelihood of undamaged genitals (aOR 1.5, 95% CI 1.3-2.1). Perinatal indicators of neonatal distress were increased among Nigerians, namely a low Apgar score (aOR 2.6, 95% CI 1.4-4.9), NICU admission (aOR 1.7, 95% CI 1.1-2.8), and stillbirth (aOR 4.0, 95% CI 1.3-12.8). In conclusion, sub-Saharan African women of Nigerian origin appeared more vulnerable and exposed to several adverse pregnancy outcomes. These disparities call for the improvement of obstetric care in this immigrant group. *(Afr J Reprod Health 2021; 25[4]: 43-51).*

Keywords: Immigrants, Nigerian women, maternal health, pregnancy complications

Résumé

Parmis les femmes migrantes, des conditions de santé défavorables et des événements obstétricaux indésirables sont observés plus souvent que chez les parturientes natives. Cette étude rétrospective observationnelle a analysé certaines issues de la grossesse sélectionnées dans une population nigériane accouchant à l'Hôpital Universitaire de Vérone. Par rapport aux témoins nationaux, le fait d'être nigérian était associé à la prématurité (aOR 1.6, 95% CI 1.1-2.2) et à la césarienne (aOR 2.2, 95% CI 1.5-2.7). Aucune différence n'a été trouvée dans les taux d'accouchements instrumentaux et le groupe d'immigrants avait la moitié du risque de déchirures génitales (aOR 0.6, 95% CI 1.1-2.2) avec une probabilité plus élevée d'organes génitaux intacts (aOR 1.5, 95% CI 1.3-2.1). Les indicateurs périnatals de détresse néonatale ont été trouvés augmenté chez les nigérians, à savoir un faible score d'Apgar (aOR 2.6, 95% CI 1.4-4.9), l'admission en soins intensifs néonatals (aOR 1.7, 95% CI 1.1-2.8) et la mortinatalité (aOR 4.0, 95% CI 1.3-12.8). En conclusion, les femmes africaines subsahariennes d'origine nigériane semblaient plus vulnérables et exposées à plusieurs issues défavorables de la grossesse. Ces disparités appellent l'amélioration des soins obstétricaux dans ce groupe d'immigrés. *(Afr J Reprod Health 2021; 25[4]: 43-51).*

Mots-clés: Immigrants, femmes Nigerianes, santé maternelle, complications de la grossesse

Introduction

Since the migratory wave first started more than two decades ago, the number of women of childbearing age leaving their countries of origin to seek a better life in Europe is still on the rise. Their reproductive health is a major public health concern and providing good quality care to these women continues to be a challenge for clinicians and researchers in immigrant-receiving industrialized societies. Health care providers are faced with multiple migration-related variables, such as ethnicity, nutritional status, legal entitlements, living conditions, length of time in the receiving country, and language fluency. The heterogeneity of the newcomers is prejudicial to the effectiveness of the national health services. No matter the place of origin, health care is offered free, but for groups of undocumented migrants access to the health system is often a problem[1].

In 2016 one Italian newborn out of five had a mother of foreign origin and one newborn out of

seven enlarged a household where both parents had settled after migrating from a low resource country. As in other parts of northern Italy, in the Veneto region, newborns of foreign couples account for about 20% of the local births[2]. In Italy as in other high-resource countries, epidemiological studies on recently migrated populations have recorded health inequalities inclusive of disparities in perinatal health caused by the multiple needs[3,4]. Adverse maternal outcomes for migrant women comprise the most critical events and maternal mortality and severe morbidity occur more frequently than among native-born women[5,6].

There is also evidence that, within the immigrant population, some ethnic groups face a higher obstetric risk: results from several studies have identified sub-Saharan African (SSA) women more often prone to adverse pregnancy outcomes[7–10]. National registers show that Nigerians constitute the largest ethnic minority migrating to our country for humanitarian reasons, 22.7% of the total asylum-seeking population in 2017, one-third of it being women in fertile age, particularly vulnerable and often victims of human trafficking and gender-based violence[11].

Verona city and province host more than 110,000 foreign residents, including women of fertile age whose pregnancies are cared for in local Institutions[11]. Among them, a relevant proportion comes from the SSA region and, as in many other receiving countries, the largest group has a Nigerian origin[12]. This study aims at assessing maternal health and pregnancy outcomes among Nigerian women of immigrant origin delivering in a large referral hospital of the Italian Veneto region.

Methods

Setting and data source

The Veneto Region is one of the richest Italian regions with a population of just under 5 million, 10% of them being of foreign origin. Maternal care is provided within a 3-level system, which includes 34 Maternities, 10 of them assisting >1000 deliveries per year; among the latter, there are 2 larger referral academic hospitals. According to regional statistics births in the Veneto region, 29.2% of births relate to women of foreign origin, occurring with variable rates as a function of the size of the Maternity[13,14].

The institution where the study took place is a 3rd-level referral hospital for all obstetric complications and the Neonatological Intensive Care Unit (NICU) takes care of all gestational age newborns (from 500 g/ 22+ weeks). The observational retrospective study compared two groups of singleton pregnant patients giving birth during the 5 years from January 1st, 2013 to December 31st, 2017 at the Obstetrical Department of the University Hospital of Verona. Data sources were the institutional delivery room database and the regional registry for deliveries (CeDAP - Certificato di Assistenza al Parto)[15].

Selected maternal and perinatal indicators were: age at delivery, parity, previous Cesarean section (CS) and induced abortions; rates of preterm births (gestational age < 37 and < 32 weeks), rates of neonatal low birth-weight (LBW < 2,500 g and VLBW < 1,500 g); SGA and LGA newborns. With respect to the mode of delivery: total Cesarean sections, CSs during labor, and assisted vaginal deliveries (vacuum). Genital trauma was assessed as undamaged, episiotomy, tears. Indicators of neonatal outcomes included birth weight, low Apgar score (≤ 7 at 5'), metabolic acidemia, admission to NICU, stillbirths.

Antenatal care (ANC) indicators and comorbidities, when available for Nigerian women, included: gestational week at the first antenatal visit and first ultrasound examination, hypertensive disorders, BMI, and GDM. Acid-base analysis was performed in all cases immediately after birth using a RAPIDPoint 405 Blood Gas analyzer. Cutoff values for identifying fetal metabolic dysfunction were pH < 7.05 and BD in excess of 12 mmol/l in the cord artery according to reference studies[16]. Criteria for SGA and LGA determination followed validated weight percentile charts[17]. STROBE checklist for observational studies has been followed in the process of article writing[18].

Study population

The total population with a viable gestation attending the delivery room of the Verona academic institution during the 5-year study period included 8,783 parturients, of whom 3,235 (36.8%) were

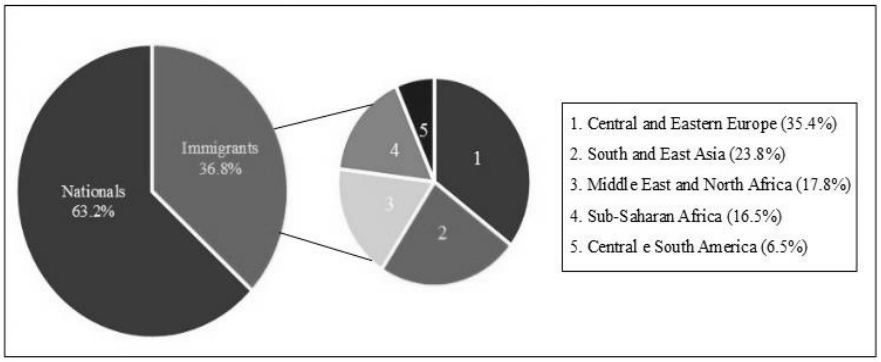

Figure 1: Subgrouping of the immigrant population during the study period

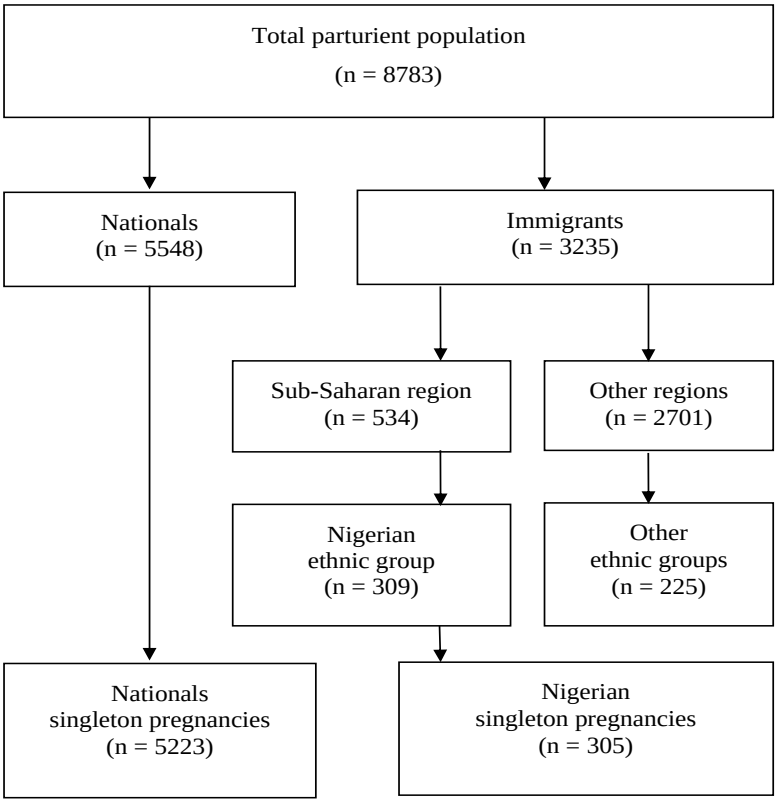

Figure 2: Flowchart for selection of the study population

immigrants. Within this latter group, women from the sub-Saharan region were 534, accounting for 16.5% of the whole immigrant group (Figure1); 309 of them were of Nigerian origin. Singleton pregnancies were 5,223 and 305 for the nationals and this African ethnic group, respectively (Figure2). Thus, the two study groups were made of pregnant women of Nigerian origin and Italian parturients who served as controls. Definition of SSA countries followed UNDP regional criteria[19]. Only singleton pregnancies were included since multiple gestations would introduce a bias with regards to birth weight and gestational age at delivery.

Statistical analysis

Data were collected using Microsoft® Office Access 2003 and analyzed using Python. The differences in continuous data - age, gestational age, and birth weight - were analyzed using the Student t-test, implemented in Python's scipy module.

Categorical data were compared using Fisher exact test. Maternal and neonatal outcome parameters were analysed using multivariate analysis: a multi-predictor logistic model was fitted to the data to test the research hypothesis regarding the higher risk of complications in Nigerian patients; the logistic regression analysis was carried out by Python's statsmodels module. Statistical significance for individual regression coefficients – and hence the adjusted odds ratios – was tested using likelihood ratios. Confidence intervals were computed by the asymptotic normality of the maximum likelihood estimated coefficients. Statistical significance was set at $p < 0.05$.

Results

Antenatal care (ANC) indicators and comorbidities of Nigerian women

Data were available in a subgroup of 151 immigrant patients: prevalence of timely access during the 1st trimester was 37.2 %, mean gestational age at first evaluation being 16 weeks; notwithstanding the late access, 75.3 % of women received a 2nd trimester ultrasound at an appropriate time. BMI measured at first outpatient visit identified the following categories of weight excess: overweight (43.0%), obesity of 1st, 2nd, 3rd class (17.9 %, 10.6 %, and 2.6 % respectively). Gestational diabetes (GDM) occurred in 13.3 %, of which approximately 1/3 (4.8 %) required insulin treatment. Hypertensive disorders, inclusive of chronic and gestational cases, affected 22.0 % of the patients in the subgroup, however late access and lack of data on proteinuria hampered differentiation.

Differences between Nigerians and natives

Reproductive characteristics and maternal outcomes are presented in Table 1 and Table 2. Nigerian women were overall younger ($p< 0.001$) but less often nulliparous (OR 0.5, CI 0.4-0.6), with significantly different rates of previous CS and induced abortion ($p< 0.001$). They carried a greater risk of preterm birth (aOR 1.6, CI 1.1-2.2), and very preterm birth (aOR 2.0, CI 1.2-3.5). Their mode of delivery was more frequently a Cesarean section (aOR 2.2, CI 1.5-2.7) with a higher risk of CS during labor; they shared with the nationals the same rate of instrumental delivery with vacuum ($p= 0.5$). Nigerians compared favorably in terms of vaginal tears (aOR 0.6, CI 0.4-0.8) and perineal integrity (aOR 1.5, CI 1.3-2.1) with no significant difference in episiotomy rates (aOR 0.8, CI 0.5-1.4).

Neonatal outcomes in the two groups are shown in Table 3: birth-weights were similar ($p= 0.7$) and no significant differences were found concerning LBW (aOR 0.6, CI 0.3-1.1), VLBW (aOR 1.7, CI 0.5-5.6), and SGA newborns (aOR 0.8, CI 0.5-1.3). Immigrant women delivered significantly more often LGA babies (aOR 1.6, CI 1.1-2.5) and, with regard to selected perinatal indicators, had higher rates of low Apgar score (aOR 2.6, CI 1.4-4.9), admission to NICU (aOR 1.7, CI 1.1-2.8) and stillbirths (aOR 4.0, CI 1.3-12.8).

Discussion

Declining natality among the native-born population of western industrialized nations is being compensated by the higher fertility rate of women who, in recent years, have settled after completing their migratory project.

This population represents a big challenge for the local health workers, having reached the country of destination through dangerous migratory patterns normally avoided by economic migrants. Increased risk of infectious disease and poor maternal nutritional status are commonly observed in women who have resided in refugee camps whereas economic migrants generally arrive in better health[6].

Several authors have called attention to the higher risk of adverse maternal-fetal outcomes associated with Nigerian women[7–10,12]. Lack of effective contraception use explains the high rates of induced abortions, either by means of legal or illegal procedures, often through self-administered drugs: 56.4% of our Nigerian patients conceded voluntarily interrupting an ongoing gestation at least once before the index pregnancy.

Table 1: Reproductive characteristics of the study population

Indicator	Nigerians n=305 n (%)	Nationals n=5223 n (%)	OR (95% CI)	P-value
Age (y)				
Mean ± SD	31.8±5	33.1±5		
Range	16-43	15-52		
Median	32	33		< 0.001
Nulliparity	95 (31.1)	2609 (50.0)	0.5 (0.4-0.6)	< 0.001
Previous C-section	96 (31.5)	712 (13.6)	2.9 (2.3-3.8)	< 0.001
Induced abortion	172 (56.4)	213 (4.1)	30.4 (23.3-39.6)	< 0.001

Table 2: Maternal outcomes in the study population

Indicator	Nigerians n=305 n (%)	Nationals n=5223 n (%)	OR (95% CI)	P-value	aOR (95% CI)	P-value
Gestational age at birth						
Mean ± SD	38.1±3.1	38.7±2.7		< 0.005		< 0.005
Range	(24-42)	(22-42)				
Median	39	39				
<37 weeks	47 (15.4)	581 (11.1)	1.4 (1.0-2.0)	< 0.05	1.6 (1.1-2.2) †	< 0.01
<32 weeks	16 (5.2)	172 (3.3)	1.6 (0.9-2.7)	0.07	2.0 (1.2-3.5) †	< 0.05
Mode of delivery						
C-section	142 (46.6)	1609 (30.8)	1.9 (1.5-2.4)	< 0.001	2.2 (1.5-2.7) †	< 0.001
Vaginal instrumental	3 (1.8)	141 (3.9)	0.4 (0.1-1.1)	0.07	0.7 (0.2-2.2) †	0.5
C-section during labor*	42 (20.5)	406 (10.1)	2.3 (1.6-1.1)	< 0.001	2.9 (2.0-4.4) †	< 0.001
Genitals						
Undamaged	65 (39.9)	770 (21.3)	2.4 (1.8-3.4)	< 0.001	1.5 (1.3-2.1) ‡	< 0.05
Episiotomy	16 (9.8)	636 (17.6)	0.5 (0.3-0.8)	< 0.05	0.8 (0.5-1.4) ‡	0.5
Tears	83 (50.9)	2232 (61.8)	0.6 (0.5-0.9)	< 0.01	0.6 (0.4-0.8) ‡	< 0.05

†Adjusted for age, parity, previous-CS
‡Adjusted for age, parity, and birth weight
* Based on total spontaneous and induced labors

Table 3: Neonatal outcomes in the study population

Indicator	Nigerians n=305 n (%)	Nationals n=5223 n (%)	OR (95% CI)	P-value	aOR (95% CI)	P-value
Birth weight (g)						
Mean ± SD	3152 ± 737	3166 ± 638		0.7		0.7
Range	550-4890	440-4920				
Median	3270	3250				
< 2500 g	32 (10.5)	501 (9.6)	1.1 (0.7-1.6)	0.6	0.6 (0.3-1.1) †	0.1
< 1500 g	18 (5.9)	171 (3.3)	1.8 (1.1-3.0)	< 0.05	1.7 (0.5-5.6) †	0.4
SGA	21 (6.9)	500 (9.6)	0.6 (0.4-1.1)	0.1	0.8 (0.5-1.3) ‡	0.5
LGA	29 (9.5)	262 (5.0)	1.9 (1.3-2.9)	< 0.001	1.6 (1.1-2.5) ‡	< 0.05
5' Apgar score ≤7	16 (5.2)	106 (2.0)	2.6 (1.5-4.5)	< 0.001	2.6 (1.4-4.9) δ	< 0.01
Metabolic acidemia*	3 (1.0)	76 (1.5)	0.6 (0.2-2.1)	0.5	1.0 (0.3-3.3) δ	0.9
Admission to NICU	43 (12.1)	477 (9.1)	1.6 (1.6-2.2)	< 0.005	1.7 (1.1-2.8) δ	< 0.05
Stillbirth	5 (1.6)	17 (0.3)	5.1 (1.8-13.9)	< 0.005	4.0 (1.3-12.8) δ	< 0.05

† Adjusted for age, parity, gestational age, previous C-section
‡ Adjusted for age, parity, previous C-section
§ Adjusted for age, parity, gestational age, previous C-section, birth weight
δ Adjusted for age, parity, gestational age, previous C-section
* pH<7.05 with BD >12 mmol/l

Unintended pregnancy rates have also been studied in an African refugee population resettled in a New York state county, being largely superior to those found in the U.S.-born white population[20]. We know from a previous study that women from the SAA region face an increased risk of adverse obstetric outcomes: late access to ANC, language barrier and reduced compliance with medical recommendations and drug prescription are among the reasons for health disparities[21]. Our present finding of 16 weeks as mean gestational age at first ANC access confirms the general trend observed among migrant women who are less likely to initiate ANC timely, with fewer visits during pregnancy compared with nationals; recognized barriers for ANC attendance are lack of knowledge regarding receiving health systems and poor language proficiencies[22,23].

The issue of fetal growth and preterm birth has been addressed in immigrant-receiving societies, and within a substantial heterogeneity depending on the maternal region of birth, evidence suggests that the risk of preterm delivery is greater for African and Asian-born women[24]. Our results show that the Nigerian minority is, in fact, affected by more frequent preterm births, a finding that persists also for gestational ages of less than 32 weeks. The increase of preterm deliveries in our migrant group may be due, at least to some extent, to the progressive deterioration of the health behaviors, which is said to have the potential to curtail the "healthy immigrant effect" even among regular economic migrants[25]. Pre-gestational diabetes and obesity among migrants become more common with increasing duration of residence in the host country and the change in food consumption would justify a strategy of dietary advice to these women in both the preconception and antenatal periods[26–28].

The migrant group of this study appears to have pregnancy complications that impact the duration of gestation: we often remark excessive body weight among Nigerian women before and during pregnancy, not differently from the observations of a UK study which identifies this minority group as being at risk of obesity[29]. Our findings with regard to this aspect, based on BMI criteria in the subgroup in which information was collected at a first antenatal visit, identify a 31.1% prevalence of different classes of obesity whereas national registers indicate rates of 5.6 to 7.4% among Italian women aged 25-44 years[30].

Non-communicable diseases arising from obesity include diabetes which is exceedingly represented within the African population of this study. According to a large systematic review, being a migrant is a marker for increased risk of GDM and this is more true for the African migrant sub-category[31]. Just like the finding of weight excess, the prevalence of GDM found in the Nigerian subgroup highly exceeds the Italian national rates of 6-7%[32] and could be included among the factors contributing to the observed prevalence of LGA babies.

In Southern Africa, hypertensive disorders are closely linked with maternal and infant morbidity and mortality, and studies quantify rates of pre-eclampsia between 8 and 10%[33,34]. In receiving countries, among migrant sub-categories, SSA origin has been found associated with the highest rate of eclampsia cases[6]. The relevant number of hypertensive disorders in the Nigerian women of this study, suggests adverse implications in relation to the observed perinatal outcomes. Cesarean births are among perinatal disparities which have been observed between migrants and receiving-country-born women: a large meta-analysis shows that women from SSA consistently have an excess of Cesareans, particularly in Southern European countries[35].

In this study, Cesarean rates turn out to be much higher as well, both before labor and urgent in-labor: the larger number of Nigerians with a history of previous Cesarean and, as we observe in our daily practice, scarcely inclined to choose a trial of labor, cannot be ignored when looking at the difference with corresponding rates among native-born women. Concerning the association between cesarean deliveries and the migrant condition, doubts have been expressed about the role of "immigrant background" as a contributing factor to emergency CS and adverse neonatal outcomes[36]. Conversely, in our labor ward, we often witness situations where language and cultural barriers lower the quality of care and in which reduced support to the laboring woman becomes a major obstacle to a normal vaginal delivery.

These factors should be taken into account also when evaluating our findings related to

neonatal wellbeing at the time of birth: the higher rates of low Apgar score and transfers to NICU may signal difficulties in keeping good standards of obstetric care pre-and during labor. Another relevant health indicator related to pregnancy that is of concern in women who have immigrated to Europe is fetal mortality[37]. Stillbirth rates have been largely studied in European as well as in immigrant women and findings from different studies are consistent in showing increased risks of giving birth to a stillborn child among migrants from Pakistan, Turkey, and SSA[38,39]. Fetal mortality occurred significantly more often in the Nigerian group and likely recognizes the low socioeconomic condition and the suboptimal antenatal care as possible causative factors, just as it has been observed in any newly settled female population coming from a low-resource country[40].

Strengths and limitations

This study explores relevant perinatal outcomes within an ethnic group that stands out for being more vulnerable in the complex scenario of international migration. Despite being an English-speaking community, Nigerian women are disadvantaged in access to health services just like other foreign communities of the Verona area, such as those originating from Pakistan and Sri Lanka. Furthermore, this African population has critical aspects which include unhealthy dietary habits and precarious living conditions which spare neither the already partially integrated multiparous woman nor the recently immigrated young nullipara. These issues are still very topical and will likely persist as long as the migratory stream continues, hence they justify constant monitoring for inequalities. Different risks related to maternal care certainly exist in other minorities, but we consider valuable the choice of focusing on this specific ethnic group within the entire migrant population.

There are limitations of this study that need to be mentioned. Firstly, the Nigerian woman's status was not investigated, and no distinction was made between the condition of economic or asylum-seeking migrants. The length of stay in the receiving country was not accounted for and, consequently, the observations refer to women who might have accomplished a partial integration and also to newcomers. The latter likely suffer the implications of limited access to antenatal services due to an irregular status and lack of legal entitlements. Data concerning ANC and maternal hypertensive and metabolic conditions were only partially available, but the sample was considered representative. Late access to ANC is also a possible bias for rates of preterm births, questioning the accuracy of gestational age estimates, although its effects have likely been reduced by a fair level of 2nd trimester evaluation.

A difference which was not accounted for was rates of IVF pregnancies in the two groups: the extent of ART techniques in the native population varies from 4.7% in the younger group aged 25-34 years and reaches 60.3% in women aged ≥45, whereas Nigerian women have rarely access to ART services; the only mitigating factor in our study was the exclusion of twin pregnancies. Finally, the immigrant population has been studied in a single academic institution and results may not be generalizable to other settings.

Ethical approval

The local Ethics committee ruled that no formal ethics approval was required in this observational retrospective study. Permission to review patients' clinical data was allowed within the internal institutional procedure through identification and upon responsibility of the principal investigator (GZ). Patients' consent to the study was waived due to the retrospective nature of the review, which was limited to medical records which were anonymized and maintained with confidentiality.

Conclusion

The Nigerian population of this study represents a group of women in whom the effects of migration appear to impact reproductive outcomes with a higher risk of maternal and neonatal health problems than their native counterparts. Reduction of these disparities needs the implementation of early preventive measures to control communicable and non-communicable diseases through a coordinated action involving the national health system and local voluntary associations that support the Nigerian woman.

In a broader perspective, a greater commitment of the institutions is desirable, through the adoption of more effective national and trans-national policies to meet the expectations of the different groups of incoming migrants.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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