

# Perinatal Outcome and Financial Impact of Eritrean and Sudanese Refugees Delivered in a Tertiary Hospital in Tel Aviv, Israel

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**ABSTRACT:** **Background:** A growing number of Eritrean and Sudanese refugees seek medical assistance in the labor and delivery ward of our facility. Providing treatment to this unique population is challenging since communication is limited and pregnancy follow-up is usually absent.

**Objectives:** To compare the perinatal outcome of refugees and Israeli parturients.

**Methods:** The medical and financial records of all refugees delivered between May 2010 and April 2011 were reviewed. Perinatal outcome was compared to that of native Israeli controls.

**Results:** During this period 254 refugees were delivered (2.3% of deliveries). Refugees were significantly younger and leaner. They had significantly more premature deliveries under 37 weeks (23 vs. 10,  $P = 0.029$ ) and under 34 weeks gestation (9 vs. 2,  $P = 0.036$ ) with more admissions to the neonatal intensive care unit (15 vs. 5,  $P = 0.038$ ). Overall cesarean section rate was similar but refugees required significantly more urgent surgeries (97% vs. 53%,  $P = 0.0001$ ). Refugees had significantly more cases of meconium and episiotomies but fewer cases of epidural analgesia. There were 2 intrauterine fetal deaths among refugees, compared to 13 of 11,239 deliveries during this time period ( $P = 0.036$ ), as well as 7 pregnancy terminations following sexual assault during their escape. Sixty-eight percent of refugees had medical fees outstanding with a total debt of 2,656,000 shekels (US\$ 767,250).

**Conclusions:** The phenomenon of African refugees giving birth in our center is of unprecedented magnitude and bears significant medical and ethical implications. Refugees proved susceptible to adverse perinatal outcomes compared to their Israeli counterparts. Setting a pregnancy follow-up plan could, in the long run, prevent adverse outcomes and reduce costs involved in treating this population.

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**KEY WORDS:** African refugees, perinatal outcome, prematurity, sexual assault

It is estimated that some 50,000 African immigrants from Eritrea and Sudan reside in Israel [1]. These immigrants reach Israel by foot after escaping through the Egyptian border, and in the last 3 years the numbers have nearly tripled. These immigrants lack medical insurance and, therefore, pregnancy follow-up and prenatal care. Moreover, the medical treatment of this population is exceptionally complicated as most of them do not speak Hebrew, English or Arabic, making even simple communication an impossible task. In the literature, there are well-established disparities in prenatal outcomes of minorities living among different native populations; these include higher rates of low birth weight, preterm deliveries, perinatal mortality and congenital anomalies [2-7]. A previous report from our own center found that non-Israeli parturients were susceptible to adverse perinatal outcomes [8]. This report related to a diverse population of foreign laborers mainly from Asia and Europe. The objective of the present study was to describe the magnitude of this current phenomenon, to compare the perinatal outcome of this unique population with that of native Israeli controls, and to estimate the financial impact imposed on our health system by this poor population.

## SUBJECTS AND METHODS

We retrospectively reviewed the medical as well as financial records of all African immigrants from Eritrea and Sudan who delivered in our tertiary referral center between May 2010 and May 2011. Outcomes were compared with those of native Israeli controls delivered next, as recorded in our labor and delivery log book. All statistics were done using the SPSS for windows software (SPSS Inc., Chicago, IL, USA). Student's *t*-test and chi-square test were used to evaluate differences between patient groups where appropriate. A *P* value < 0.05 was considered significant.

## RESULTS

During the one year study period 11,239 women were delivered at our center. Of these, 254 women were Eritrean and Sudanese immigrants, comprising 2.3% of all deliveries. Among these deliveries were seven late terminations of pregnancies for

**Table 1.** Demographic characteristics of the study population

|                                    | Refugees<br>(n=247) | Controls<br>(n=247) | P value  |
|------------------------------------|---------------------|---------------------|----------|
| Mean age (yr)                      | 25.9                | 32.5                | < 0.0001 |
| Primigravida                       | 126                 | 83                  | 0.0002   |
| Primipara                          | 137                 | 109                 | 0.0016   |
| Pre-pregnancy weight (kg)          | 55.4                | 60.4                | < 0.0001 |
| Weight at delivery (kg)            | 65.2                | 73.7                | < 0.0001 |
| Mean pregnancy weight gain (kg)    | 9.8                 | 13.3                | < 0.0001 |
| Pre-pregnancy BMI <sup>1</sup>     | 22.1                | 22.1                | NS       |
| BMI <sup>2</sup> at delivery       | 25.8                | 27.2                | 0.036    |
| BMI <sup>2</sup> -BMI <sup>1</sup> | 3.76                | 4.95                | 0.0005   |

women who were sexually assaulted during their journey to Israel. Demographic data are summarized in Table 1. African immigrants were significantly younger with a mean age of 25.9 years compared to 32.5 for Israeli women ( $P < 0.0001$ ). Likewise, there were significantly more primiparas among the immigrants (54% vs. 43%,  $P < 0.05$ ). Although African immigrants were significantly leaner before pregnancy (55.4 kg vs. 60.5 kg,  $P < 0.0001$ ), the mean pre-pregnancy body mass index was similar between the populations (22.1). At delivery, it was apparent that African immigrants gained significantly less weight during their pregnancy, as reflected by a significantly lower BMI (25.8 vs. 27.2,  $P < 0.05$ ). Demographic data are summarized in Table 1.

Maternal and neonatal outcomes are shown in Table 2. African immigrants required fewer cesarean deliveries (13% vs. 20%), but these numbers failed to reach statistical significance ( $P = 0.051$ ). When looking at the type of cesarean delivery, immigrants were 27.4 times more likely to require urgent cesarean section as compared to elective surgery (96.8% vs. 54%,  $P < 0.0001$ , odds ratio 27.4, 95% confidence interval 3.5–582). During vaginal deliveries, African immigrants had significantly more episiotomies (32% vs. 20%,  $P < 0.05$ ), while the rate of epidural anesthesia was significantly lower (31% vs. 67%,  $P < 0.001$ ). There was no difference in the rate of preeclampsia between the groups, although the numbers were small. We could not comment on the rate of gestational diabetes among Africans, as almost none had prenatal screening. There were significantly fewer emergency room visits among Africans during the pregnancy (1.4 vs. 2.4 visits per maternity,  $P < 0.0001$ ). The mean hospital stay post-delivery was similar between the groups (3.5 days).

Table 2 provides data on neonatal outcome. There were 2 stillbirths among the African immigrants compared to 13 of 11,239 deliveries among non-African immigrants during this time period (0.81% vs. 0.11%,  $P < 0.05$ ). There was also one case of intrapartum fetal death: an Eritrean patient who presented

<sup>1</sup>BMI = body mass index

**Table 2.** Maternal and neonatal outcomes

|                                     | Refugees<br>(n=247) | Controls<br>(n=247) | P value  |
|-------------------------------------|---------------------|---------------------|----------|
| Urgent vs. elective CS (%)          | 97                  | 53                  | <0.0001  |
| Epidural analgesia during labor (%) | 31                  | 67                  | < 0.0001 |
| Episiotomy (%)                      | 32                  | 20                  | 0.008    |
| Preterm delivery < 37 wk (%)        | 9.3                 | 4                   | 0.02     |
| Preterm delivery < 34 wk (%)        | 3.6                 | 0.8                 | 0.036    |
| Neonatal weight < 2000 g (%)        | 3.6                 | 1.6                 | 0.26     |
| Neonatal weight < 2500 g (%)        | 7.6                 | 4                   | 0.12     |
| Neonatal weight > 4000 g            | 8.4                 | 4.4                 | 0.099    |
| Apgar < 8 at 5 min (%)              | 3.7                 | 1                   | 0.035    |
| NICU admission (%)                  | 6                   | 2                   | 0.03     |
| Meconium (%)                        | 31                  | 12.5                | < 0.0001 |

CS = cesarean section

in advanced labor with double footling presentation. We found significantly more cases of prematurity among refugees. African neonates were 2.4 times more likely to be delivered prematurely before 37 weeks (9.3% vs. 4%,  $P = 0.02$ , OR 2.46, 95%CI 1.1–5.7) and 4.5 times before 34 weeks gestation (3.6 vs. 0.8,  $P = 0.036$ , OR 4.7, 95%CI 0.94–31.7). On the other hand, post-date deliveries over 42 weeks were significantly more common among Africans (7.7% vs. 1.2%,  $P < 0.001$ , OR 6.8, 95%CI 1.8–29.3). Although we found significant differences in the rate of premature deliveries, the differences in neonatal weight observed between the groups, though striking, failed to reach statistical significance. African neonates had significantly more cases of meconium and Apgar scores < 8 at 5 minutes and were 3.1 times more likely to require admission to the neonatal intensive care unit. After reviewing the financial records, 68% of refugees had medical fees outstanding with a total debt of US\$ 767,250. This sum includes only the maternal hospitalization around the delivery and not neonatal NICU fees, which are much higher.

## DISCUSSION

The phenomenon of African immigrants delivered at our center has reached significant numbers and can no longer be overlooked or disregarded. In the year following collection of these data, the numbers more than doubled, and today the African population accounts for more than 5% of deliveries at our center. The implications of this phenomenon are far reaching, changing the characteristics of the population we treat and demanding adjustments in the nature of our work in many respects.

Lack of antenatal care is a risk factor for poor perinatal outcome [9–12]. Almost 100% of the immigrant women in our

OR = odds ratio

CI = confidence interval

NICU = neonatal intensive care unit

study, with no clear legal status, have no medical coverage of any kind and as a result had very little, if any, prenatal care. Moreover, the huge cultural differences, the language barrier, as well as lack of knowledge regarding the recommendations for prenatal care (ultrasound follow-up, vitamin supplements, etc.) probably reduced even further the medical assistance this poor population sought and received during their pregnancies. The lack of antenatal care can be reflected in many of the parameters studied, the most striking being the significant difference in pregnancy weight gain between native and African parturients. This parameter reflects poor nutrition, which includes other related aspects of poverty such as lack of vital vitamin supplementation, poor sanitation, and lack of access to a pregnancy follow-up plan that directs and follows the parturient's dietary requirements during pregnancy.

Previous reports on the perinatal outcome of minorities have documented clear disparities between immigrant and native populations [2,4-7]. A meta-analysis of perinatal outcomes in six different countries found a higher rate of stillbirths and a higher cesarean section rate for African Somali immigrants as compared to the native population [3]. Accordingly, a systematic review of 65 epidemiological studies comparing the pregnancy outcomes of immigrant versus native women from 12 different hosting European countries showed a clear disadvantage for the immigrants in all outcomes considered, including low birth weight, preterm delivery, perinatal mortality, and congenital malformations [2]. Maslovitz et al. [8] previously described the poor perinatal outcome of non-residents delivered at our center, including a higher prematurity rate, higher NICU admission rate, and significantly more cases of stillbirths. Our findings support the existing reports from both our own center and other centers treating immigrant populations. We found significantly higher rates of prematurity < 37 weeks and < 34 weeks, higher rates of lower Apgar scores at 5 minutes, and higher rates of meconium-stained fluids. In accordance, we found a significantly higher rate of NICU admissions, an end-point influenced by a multitude of indices including the lack of prenatal screening, gestational age at delivery, birth weight, and intrapartum events. The stillbirth rate among African immigrants was also significantly higher, with one case of intrapartum fetal death, an extremely rare occurrence in our hospital. This case, a patient who presented in advanced labor with double footling presentation, could have been prevented by elective surgery. The 97% rate of urgent cesarean sections among Africans in our study, with the increased morbidity associated with urgent surgery as compared to elective surgery, also serves as an example of the total lack of access to any medical supervision during their pregnancies. In fact, there was one planned elective surgery in the African immigrant group: an HIV-positive patient referred by the HIV clinic.

HIV = human immunodeficiency virus

It is our routine practice to offer elective induction of labor after 41 weeks gestation. Although pregnancy dating among Africans in our study was often difficult to establish, we found a significantly higher rate of post-date pregnancies among African refugees, most probably due to the lack of access to antenatal care. As previously mentioned, communication with the African population in our study was almost impossible as most do not speak Hebrew, English or Arabic. Translation services are not readily available and proved ineffective due to the odd hours and the urgent nature of our work. Probably, as a result, we found a significantly lower usage of regional epidural anesthesia among immigrants. The simple task of explaining the effect of the anesthesia or the course and complications of the procedure became a major obstacle and many times caused huge frustration for the medical staff since the anesthesia services in our labor ward are readily available. Informed consent that was translated to Tigrinya did not significantly raise the demand for epidural anesthesia. Another factor that may be influenced by the language barrier is the significantly higher rate of episiotomies found among immigrants. This could be attributed to several factors: a) difficulty in directing maternal pushing by the midwives during the second stage of labor; b) differences in pelvic anatomy; or c) the fact that many of the Africans we deliver had undergone female circumcision, distorting further the shape of their genitalia.

The steady increase in the African population seeking medical assistance at our center had several other consequences. After reviewing the financial records of these patients during the one year study period, we found that 68% of immigrants had medical fees outstanding with a total maternal debt of 2,656,000 shekels (US\$ 767,250). Since almost none of the immigrants have any medical coverage, this loss is covered solely by the hospital. Moreover, the steady increase in the African population that we treat inversely correlated to a significant decrease in the native Israeli population in our labor and delivery ward and contributed further to a huge loss of income, which is difficult to estimate.

An important humanitarian issue that is unique to the African population in our study was the considerable number of immigrants in our cohort who underwent elective termination of pregnancy after being subjected to sexual assault and rape during their voyage through Egypt and Sinai.

This study has a few limitations, the first being the retrospective nature of the work. Additionally, this study presents the results of our own experience, which is only one medical center among several centers that treat this population.

A recent report from Cacciani and co-authors [5], who analyzed almost 300,000 births across two time periods, indicated improvement in perinatal outcomes of African immigrants in Italy. The authors noted that the improvements could be due to a general improvement in immigrants' health in the past decade, or it may indicate successful application of policies that increase accessibility to mother-child health services for legal and illegal immigrants in Italy during the peri-conception and

prenatal periods. A similar report from Sweden [6] analyzing 219,832 births among foreign-born women found a significant decrease in perinatal death rate across time since immigration. Likewise, implementing a pregnancy follow-up plan in an outpatient setting for the considerable number of African immigrants in our district could have the same potential for improving the immigrants' general health and ameliorating the adverse perinatal outcomes observed in this population. From an economic viewpoint, in the long run, such a clinic could reduce the huge costs involved with treating the obstetric complications of this population.

## CONCLUSIONS

The phenomenon of African refugees delivered at our center is of unprecedented magnitude and carries both medical and ethical implications. These parturients proved susceptible to adverse perinatal outcomes compared to their Israeli counterparts. Setting a pregnancy follow-up plan that might prevent adverse perinatal outcome could, in the long run, reduce financial costs involved with treating this population.

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