Neonatal complications of newborns children born of immigrant mothers in comparison with local mothers: A view of a growing immigration to Ecuador

Complicações neonatais de recém-nascidos filhos de mães imigrantes em comparação com mães locais: Uma visão de uma crescente imigração para o Equador

Complicaciones neonatales de recién nacidos hijos de madres migrantes en comparación con madres locales: una visión de la creciente inmigración a Ecuador

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Abstract
Background: In the last years, there has been a great migratory flow to Ecuador. *Purpose:* To determine if there are differences in the morbidity of children born of immigrant mothers or local mothers. *Methods:* epidemiological, observational, cross-sectional study, with two cohorts of patients, newborns from immigrant mothers, and local mothers. 220 individuals were analyzed. *Results:* 90.45% of the mothers were between 18 and 35 years old; 49.09% had a free-union marital status, 32.27% were single, 18.18% married, and 0.45 divorced, homemakers in the 75.91%, with temporarily leased housing, 89.09% live with close relatives. In 54.55%, the income was between 61 to 400 USD, 66.36% eat three meals in a day, and 70.46% of mothers had five or more prenatal controls. In 71.90% of cases, it performed prenatal controls in the facilities of the Ministry of Health in Ecuador, and it made 18.10% in their country of origin, Colombia, or Venezuela. The most common maternal risk factor was UTIs in 60.57% of mothers, followed by preeclampsia and syphilis. *Conclusion:* Children born from immigrant mothers have a higher number of neonatal complications. Most immigrant mothers arrive in conditions of poverty and get occasional and temporary jobs that allow them to earn an income of between 30 to 400 USD per month. This low income has a direct effect on the nutritional status of the mother and the fetus. Additionally, these mothers have a lower number of prenatal controls, of low quality, and more connate infections. The circle of immigrant poverty has direct health complications.
Keywords: Newborns; Immigrant mothers; Neonatal complications; Ecuador.

Resumo
Histórico: Nos últimos anos, houve um grande fluxo migratório para o Equador. *Objetivo:* determinar se há diferenças na morbidade de crianças nascidas de mães imigrantes ou mães locais. *Métodos:* estudo epidemiológico, observacional, transversal, com duas coortes de pacientes, recém-nascidos de mães imigrantes e mães locais. 220 indivíduos foram analisados. *Resultados:* 90,45% das mães tinham entre 18 e 35 anos; 49,09% possuíam estado civil em união estável, 32,27% eram solteiros, 18,18% casados e 0,45 divorciados, donas de casa nos 75,91%, com moradia temporariamente alugada, 89,09% moravam com parentes próximos. Em 54,55%, a renda era entre 61 a 400 dólares, 66,36% realizavam três refeições diárias, 70,46% das mães tinham cinco ou mais controles pré-natais. Em 71,90% dos casos, realizou controle pré-natal nas dependências do Ministério da Saúde do Equador e 18,10% no país de origem, Colômbia ou Venezuela. O fator de risco materno mais comum foi ITU em 60,57% das mães, seguido por pré-eclâmpsia e sífilis. *Conclusão:* Crianças nascidas de mães imigrantes apresentam maior número de complicações neonatais. A maioria das mães imigrantes chega em condições de pobreza e consegue empregos ocasionais e temporários que lhes permitem ganhar uma renda de 30 a 400 dólares por mês. Essa baixa renda tem efeito direto no estado nutricional da mãe e do feto. Além disso, essas mães apresentam menor número de controles pré-natais, de baixa qualidade e mais infecções congênitas. O círculo da pobreza dos imigrantes tem complicações diretas de saúde.
Palavras-chave: Recém-nascidos; Mães imigrantes; Complicações neonatais; Equador.

Resumen

Antecedentes: en los últimos años ha habido un gran flujo migratorio hacia Ecuador. *Propósito:* Determinar si existen diferencias en la morbilidad de los niños nacidos de madres inmigrantes o de madres locales. *Métodos:* estudio epidemiológico, observacional, transversal, con dos cohortes de pacientes, recién nacidos de madres inmigrantes y madres locales. Se analizaron 220 individuos. *Resultados:* el 90,45% de las madres tenían entre 18 y 35 años; El 49,09% tenía un estado civil de unión libre, el 32,27% era soltero, el 18,18% casado y el 0,45 divorciado, amas de casa en el 75,91%, con vivienda alquilada temporalmente, el 89,09% vive con familiares cercanos. En el 54,55%, el ingreso estuvo entre 61 a 400 USD, el 66,36% ingirió tres comidas al día, el 70,46% de las madres tuvo cinco o más controles prenatales. En el 71,90% de los casos realizó controles prenatales en las instalaciones del Ministerio de Salud de Ecuador, y el 18,10% en su país de origen, Colombia o Venezuela. El factor de riesgo materno más común fueron las infecciones urinarias en el 60,57% de las madres, seguido de la preeclampsia y la sífilis. *Conclusión:* los niños nacidos de madres inmigrantes tienen un mayor número de complicaciones neonatales. La mayoría de las madres inmigrantes llegan en condiciones de pobreza y consiguen trabajos ocasionales y temporales que les permiten obtener un ingreso de entre 30 y 400 dólares mensuales. Este bajo ingreso tiene un efecto directo sobre el estado nutricional de la madre y el feto. Además, estas madres tienen menor número de controles prenatales, de baja calidad y más infecciones connatas. El círculo de la pobreza de los inmigrantes tiene complicaciones de salud directas.

Palabras clave: Recién nacidos; Madres inmigrantes; Complicaciones neonatales; Ecuador.

1. Introduction

During the last decade, there has been a tremendous migratory flow of Venezuelan refugees to Ecuador, in conjunction with permanent immigration from Colombia for several decades, across the shared border, and the temporary migration of Cubans (Abbas 2019). Immigration has taken worrying dimensions in the last years (Rodríguez-Morales et al., 2019). This movement is a consequence of the current political instability and the economic crisis, especially in Venezuela. This situation is leading the migration to countries in South, Central, and North America, as well as to Europe (Torres & Castro 2019). This displacement is also leading to the importation of diseases, as recently reported (Fernández-Niño & Navarro-Lechuga, 2018).

From a Global Health perspective, it considers immigration as a transversal determinant of health. It constitutes the context, conditions, and circumstances in which changes in transnational disease health processes may occur, including the transmission of infectious diseases, the challenges for the attention of chronic diseases, mental health, and violence (Rebolledo-Ponietsky et al., 2019). Additionally, the integration of immigrants poses social, cultural, and economic difficulties for recipient societies, their political systems, and particularly for healthcare services. Likewise, South-South migration raises different logics to traditional South-North in which the receiving community always has a high degree of development that allows it to respond to the needs and demands of immigrants (Jaramillo-Ochoa et al., 2019). The most common diseases transferred through migration are malaria vector-transmitted, tuberculosis, vaccine-preventable diseases, sexually transmitted diseases, and human immunodeficiency virus infection. The direct consequence of this massive flow of people is a greater demand for health services, the emergence of new epidemiology, and an increase in state health expenditures (Fellmeth etal., 2017).

Taking Venezuela as an example, this country, in the past, had a significant investment in health facilities, and Public Health prevention efforts. However, an ongoing political and economic crisis caused by the decline in oil prices, excessive government spending, international sanctions, and inflation has also contributed to the collapse of the health system. Access to medicines and medical care is also affected, and there has been an exodus of health workers from Venezuela to other countries. Although official data is scarce, a recent survey of public and private hospitals highlighted the shortage of essential medicines and surgical supplies, with 79% of facilities that do not have access to water (Tuite et al., 2018). The collapse of Public Health facilities in this country caused an increased maternal and infant mortality and the return of infectious diseases that were controlled (Abubakar et al., 2018).

Indeed, the massive exodus of Venezuelans that seek greater economic security increased from 700,000 to 1.6 million from 2015 to 2017. During the same period, the number of Venezuelan migrants in South America increased by 900%. These numbers are probably underestimated, with the continuing social, political, and economic instability. It expected that those trends to continue (Palmer et al., 2019). An empty country, that is, with high migration rates, is a fragile country (Wickramage et al., 2018).

However, macro determinants influence immigration by such as the right to life, freedom, security, food, health, dignified life, and peace (Wild & Dawson, 2018). There is a debate between life, hunger, disease, and mental health (Williams & Pugh, 2018), when comparing the ratios between women and men; the response percentages are similar to the general average. In effect, immigration is the main issue to Public Health in any host country, and it has treated as a case-based approach, identifying specific ethical situations and vulnerabilities in each particular context (Lassi & Bhutta, 2015).

However, certain conditions originating in the prenatal period, congenital defects, and chromosomal abnormalities, as well as pneumonia and influenza, are risk factors to the health of newborns. These pathologies directly influence the maternal and neonatal morbidity. Although the rates of maternal, infant and under-five mortality in developing countries have declined significantly in the last two or three decades, the morbidity rates f newborns have decreased much more slowly. Almost half of the newborn deaths can be prevented with expand available evidence-based interventions. Such as immunization with tetanus toxoid to mothers, clean and specialized delivery care, newborn reanimation, breastfeeding exclusive, clean care of the umbilical cord and/or infection management in newborns, many require extension services and facilities-based services (D'Souza et al., 2016).

We could address a significant proportion of these morbidities through the development of community-based packaged interventions that it should complement by developing and strengthening links with local healthcare systems. Some of the recent community studies of interventions targeting women of reproductive age have shown variable impacts on maternal outcomes and, therefore, it is uncertain whether these strategies have a consistent benefit throughout the continuum of maternal and neonatal care (Hedegaard et al., 2015).

Currently, it has not carried out any study in our country to determine the complications that occur in all children born of migrant mothers. It is still unknown neonatal complications in foreign pregnant mothers in comparison with local mothers. Besides, there is not enough data about the pregnancies and of adequate follow-ups that allows identifying pregnancy problems in migrant women. Indeed, these mothers have free access to the benefits of the Ecuadorian Public Health network, on equal terms as nationals, to reduce neonatal morbidity.

The objective of this study is to determine if there are differences in the morbidity of newborns born from immigrant mothers and local mothers.

2. Methods

Research design: cuantitative, epidemiological, observational, and cross-sectional with two cohorts of patients. Sample size: 220 individuals. Context: Neonatology Unit of the Hospital of Nueva Aurora, in the period, November 2019 to January 2020. Sampling: For the calculation of sample size, it used a finite universe, with 288,123 births in the last year. For this research, it estimated each cohort with a minimum of 110 patients. Participants: two cohorts of patients, cohort 1: newborn children born of local mothers; cohort 2: newborn children of immigrant mothers. Inclusion criteria: all newborns, children of immigrant and local mothers born in the hospital, and that give their consent to participate in this study. Exclusion criteria: mothers with pre-existing diseases. Elimination Criteria: those patients not born in the hospital and those newborns in which the data of the variables are incomplete, inconsistent, or incoherent. Variables: It analyzed prenatal factors such as maternal

age, the level of education, profession/occupation, place of birth, place of residence, country of origin, marital status. Also, gynecological history, prenatal controls; socioeconomic status; type of housing; the number of house rooms; people with whom lives; the number of people who live with; work type; transit country and transit time; destination country; income food per day and, other maternal risk factors. Birth factors analyzed were the type of delivery, gestational age, weight, height, head circumference sex, APGAR. Postnatal factors: neonatal complications, neonatal conditions, stay with the mother after birth, discharge after birth, and admission to neonatology. Data sources and measurements: It collected data from medical records and collection datasheet.

Biases avoidance: It collected information always by the same person. Statistical methods: data obtained were stored in an Excel database and then analyzed with the SPSS® Statistics version 22.0 software licensed 4-2E097 I. Descriptive, and inferential statistics appropriate to the analysis were used. For the comparison between the different variables, it used the Chi-square test; it accepted a p less than 0.05 as statistical significance. Ethical criteria: An Institutional Review Board, also known as an independent ethics committee (CEISH of the San Francisco University of Quito), approved this research dated on November 15 of 2019, with the code P2019-162 TPG. Methodology: we follow the Equator network recommendations for quantitative observational studies (STROBE methodology). See the next link: https://www.equator-network .org/?post_type=eq_guidelines&eq_guidelines_study_design=observational-tudies&eq_guidelines_clinical_specialty=0&eq_ guidelines_report_section=0&s=+&eq_guidelines_study_design_sub_cat=0

3. Results

Table 1 shows the socio-demographic characteristics of mothers. In 90.45% of the mothers, it showed an age between 18 and 35 years old; 49.09% had a free-union marital status, 32.27% were single, 18.18% married and 0.45 divorced. When comparing marital status between both groups, it observed significant statistical differences with p-value 0.001. The most frequent occupation in both groups was a homemaker in 75.91%; it showed significant statistical differences with p-value 0.000. For the type of property, the majority stated that they had temporarily leased housing, with significant statistical differences between groups with a p-value of 0.000. In addition, in both groups, 89.09% live with close relatives. In 54.55% of mothers, the income was between 61 to 400 USD, with significant statistical differences with a p-value of 0.000. About the feeding, 66.36% eat three meals in a day. Based on the results of table 1, socio-demographic profile of the mothers studied are mothers with free-union marital status, homemakers, with temporary leased housing, living with close relatives, with temporary and occasional work by days, with a salary of fewer than 400 USD by month, and at least three meals a day, that means, mothers in poverty. On the other hand, when comparing both groups, the socio-demographic profile only differs in that immigrant mothers mostly work occasionally in workdays. In contrast, most of the local mothers have permanent work.

Table 2 shows that 70.46% of mothers had five or more prenatal controls when comparing the number of controls between groups; it observed statistical significance with p-value 0.000. In 71.90% of cases, it performed prenatal controls in the facilities of the Ministry of Health in Ecuador, and it made 18.10% in their country of origin, Colombia, or Venezuela. As expected, it observed a significant statistical difference between both groups with a p-value of 0.000. The most common maternal risk factor was urinary tract infection in 60.57% of mothers, followed by preeclampsia and syphilis when comparing the different risks between both groups; it observed a statistically significant difference with a p-value of 0.000.

Table 3 shows neonatal complications, stay time with the mother, Neonatology admission, discharged at 24 or 48 hours, presented a significant statistical difference between both groups. It found a clinically significant difference in newborns born of foreign mothers who showed higher neonatal complications. The most frequent neonatal complication in foreign mothers was infections, and in national mothers was icterus.

Figure 1 shows the multivariate analysis of Main Categorical Components (CATPCA). The multidimensional relationship was analyzed to characterize the groups of mothers. The variables explained were economic income, meals per day, type of work, prenatal controls, variety of neonatal complications, neonatology admission, permanence with the mother, and discharged. All of them showed significant statistical differences in the bivariate analysis, and that in the exploratory analyzes allowed a better interpretation of the dimensions. Dimension 1 allows discriminating between local and immigrant mothers. It observed the following relationships: quadrants II and III characterize national mothers, these are more associated with income between 400 to 1000 and 1000 to 2000 USD, to permanent or occasional work by contract, to more than three meals, prenatal controls between nine to 12, no neonatal complications, no admission to neonatology and the stay of newborns with the mother. It observed the characterization of immigrant mothers is associated with income less than 30 or 30 to 60 USD, with occasional work, with two meals per day, without prenatal controls or with one to four monitors, the presence of neonatal complications, and admission to neonatology and the non-stay of newborns with the mother, in quadrant I and IV.

Table 1. Distribution of socio-demographic characteristics in both groups analyzed.

Mother socio-demographic characteristics	Total	Group		p-value
		Local	Immigrants	
	n (%)	n (%)	n (%)	
Age				
<18	7 (3.18)	4 (3.64)	3 (2.73)	
18-35	199 (90.45)	96 (87.27)	103 (93.64)	0.228
>35	14 (6.36)	10 (9.09%)	4 (3.64)	
Marital status				
Free-union	108 (49.09)	58 (52.73)	50 (45.45)	
Single	71 (32.27)	24 (21.82)	47 (42.73%)	0.001*
Married	40 (18.18)	28 (25.45)	12 (10.91)	
Divorced	1 (0.45)	0 (0.00)	1 (0.91)	
Country of origin of foreigners				
Venezuela	107 (97.27)	-	107 (97.27)	-
Colombia	3 (2.73)	-	3 (2.73)	
Destination country				
Ecuador	76 (69.09)	-	76 (69.09)	
Chile	20 (18.18)	-	20 (18.18)	-
Perú	14 (12.73)	-	14 (12.73)	
Time living in Ecuador				
≤1 month	24 (21.82)	-	24 (21.82)	
2-6 months	50 (45.45)	-	50 (45.45)	
7-12 months	11 (10.00)	-	11 (10.00)	-
1-3 years	23 (20.91)	-	23 (20.91)	
>3 years	2 (1.82)	-	2 (1.82)	
Mother level of education				
Primary	43 (19.55)	26 (23.64)	17 (15.45)	
Secondary	131 (59.55)	63 (52.27)	68 (61.82)	0.298
Tertiary	46 (20.91)	21 (19.09)	25 (22.73)	

Occupation				
Housewife	167 (75.91)	76 (69.09)	91 (82.73)	
Employee	20 (9.09)	16 (14.55)	4 (3.64)	
Merchant	20 (9.09)	7 (6.36)	13 (11.82)	0.000*
Student	11 (5.00)	0 (0.00)	11 (10.00)	
Sex worker	2 (0.91)	0 (0.00)	2 (1.82)	
Home tenure				
Temporary own	8 (3.64)	8 (7.27)	0 (0.00)	
Ultimate own	48 (21.82)	48 (43.64)	0 (0.00)	
Temporary leased	152 (69.09)	46 (41.82)	106 (96.36)	0.000*
Final leased	10 (4.55)	8 (7.27)	2 (1.82)	
Without housing	2 (0.91)	0 (0.00)	2 (1.82)	
People living with				
Family members	196 (89.09)	107 (97.27)	89 (80.91)	
Friends	22 (10.00)	3 (2.73)	19 (17.27)	0.000*
Alone	2 (0.91)	0 (0.00)	2 (1.82)	
Work				
Yes	186 (84.55)	97 (88.18)	89 (80.91)	0.191
No	34 (15.45)	13 (11.82)	21 (19.09)	
Type of work				
Occasional/part time	80 (43.01)	26 (26.80)	54 (60.67)	
Occasional contract	17 (9.14)	14 (14.43)	3 (3.37)	0.000*
Permanent	73 (39.25)	57 (58.76)	16 (17.98)	
None	16 (8.60)	0 (0.00)	16 (17.98)	
Incomes				
Without income	18 (8.18)	13 (11.82)	5 (4.55)	
<30 USD$	14 (6.36)	1 (0,91)	13 (11.82)	
30-60 USD$	25 (11.36)	1 (0.91)	24 (21.82)	
61-400 USD$	120 (54.55)	57 (51.82)	63 (57.27)	0.000*
401-1000 USD$	35 (15.91)	30 (27.27)	5 (4.55)	
1001 - 2000 USD$	8 (3.64)	8 (7.27)	0 (0.00)	
Meals per day				
Two	35 (15.91)	2 (1.82)	33 (30.00)	
Three	146 (66.36)	80 (72.73)	66 (60.00)	0.000*
>3	39 (17.73)	28 (25.45)	11 (10.00)	

Note: * significant differences in the p-value ratios <0.05, based on the chi-square statistic homogeneity test
Source: medical records and collection datasheet
Elaboration: Authors (2020)

Table 2. Distribution of perinatal findings between both groups studied.

Perinatal finding	Total	Group		p-value
		Local	Immigrant	
	n (%)	n (%)	n (%)	
Type of delivery				
Vaginal	120 (54.55)	59 (53.64)	61 (55.45)	0.787
Cesarean section	100 (45.45)	51 (46.36)	49 (44.55)	
Prenatal Controls				
Without controls	9 (4.09)	2 (1.82)	7 (6.36)	
1-4	56 (25.45)	20 (18.18)	36 (32.73)	
5-8	130 (59.09)	67 (60.91)	63 (57.27)	0.000*
9-12	21 (9.55)	21 (19.09)	0 (0.00)	
>12	4 (1.82)	0 (0.00)	4 (3.64)	
Where did the checks				
MSP	151 (71.90)	88 (81.48)	63 (61.76)	
IIESS	16 (7.62)	15 (13.89)	1 (0.98)	
Private	5 (2.38)	5 (4.63)	0 (0.00)	0.000*
Colombia	7 (3.33)	0 (0.00)	7 (6.86)	
Venezuela	31 (14.76)	0 (0.00)	31 (30.39)	
Number of gestations				
1-3	184 (83.64)	93 (84.55)	91 (82.73)	
4-6	35 (15.91)	16 (14.55)	19 (17.27)	0.528
> 6	1 (0.45)	1 (0.91)	0 (0.00)	
Number of deliveries				
Without deliveries	72 (32.73)	34 (30.91)	38 (34.55)	
1-3	135 (61.36)	70 (63.64)	65 (59.09)	0.785
4-6	13 (5.91)	6 (5.45)	7 (6.36)	
Number of abortions				
Without abortions	163 (74.09)	84 (76.36)	79 (71.82)	0.442
1-3	57 (25.91)	26 (23.64)	31 (2818)	
Cesarean sections				
Without cesarean	111 (50.45)	52 (47.27)	59 (53.64)	0.419
1-3	109 (49.55)	58 (52.73)	51 (46.36)	
Living children				
1-3	203 (92.27)	101 (91.82)	102 (92.73)	0.891
4-6	17 (7.73)	9 (8.18)	8 (7.27)	
Dead children				
None	217 (98.64)	108 (98.18)	109 (99.09)	1.000
1-3	3 (1.36)	2 (1.82)	1 (0.91)	
Maternal risk factors				
Urinary tract infection	106 (60.57)	69 (75.00)	37 (44.58)	
Preeclampsia	21 (12.00)	12 (13.04)	9 (10.84)	
Syphilis	15 (8.57)	1 (1.09)	14 (16.87)	0.000*
Delivery greater than 18 hours	11 (6.29)	4 (4.35)	7 (8.43)	

Drug Use	9 (5.14)	3 (3.26)	6 (7.23)	
Other	13 (7.43)	3 (3.26)	10 (12.05)	

Note: * significant differences in the p-value ratios <0.05, based on the chi-square statistic homogeneity test.
Source: medical records and collection datasheet.
Elaboration: Authors (2020).

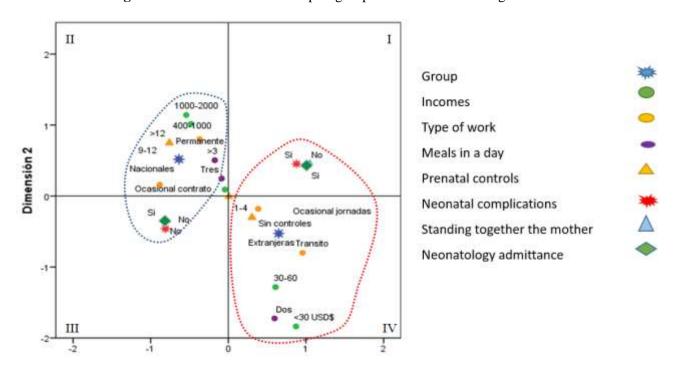**Table 3.** Distribution of the characteristics of newborns in both groups analyzed.

Characteristics of newborns	Total	Grupo		p-value
		Local	Immigrants	
	n (%)	n (%)	n (%)	
Sex				
Male	128 (58.18)	63 (57.27)	65 (59.09)	0.795
Female	92 (41.82)	47 (42.73)	45 (40.91)	
Apgar at a minute				
<7	8 (3.64)	3 (2.73)	5 (4.55)	0.721
≥7	212 (96.36)	107 (97.27)	105 (95.45)	
Apgar at the five minutes				
<7	5 (2.27)	2 (1.82)	3 (2.73)	1.000
≥7	215 (97.73)	108 (98.18)	107 (97.27)	
Weight in grams				
<2500	25 (11.36)	11 (10.00)	14 (12.73)	
2500-3500	163 (74.09)	85 (77.27)	78 (70.91)	0.745
3501-4000	28 (12.73)	12 (10.91)	16 (14.55)	
>4000	4 (1.82)	2 (1.82)	2 (1.82)	
Size in centimeters				
30-47	65 (29.55)	30 (27.27)	35 (31.82)	
48-52	151 (68.64)	77 (70.00)	74 (67.27)	0.486
>52	4 (1.82)	3 (2.73)	1 (0.91)	
Head circumference in cm				
28-33	75 (34.09)	35 (31.82)	40 (36.36)	
34-36	139 (63.18)	74 (67.27)	65 (59.09)	0.167
>36	6 (2.73)	1 (0.91)	5 (4.55)	
Gestational age in weeks				
<28	1 (0.45)	0 (0.00)	1 (0.91)	
28-36	13 (5.91)	5 (4.55)	8 (7.27)	0.468
37-41	200 (90.91)	103 (93.64)	97 (88.18)	
≥42	6 (2.73)	2 (1.82)	4 (3.64)	
Neonatal complications				
Yes	104 (47.27)	38 (34.55)	66 (60.00)	0.000*
No	116 (5273)	72 (64.45)	44 (40.00)	
Type of complications				
Infections	23 (22.12)	1 (2.63)	22 (33.33)	
Transient tachypnea of the newborn	10 (9.62)	1 (2.63)	9 (16.64)	0.001*

Icterus	10 (9.62)	7 (18.42)	3 (4.55)	
Weight raised at birth	9 (8.65)	5 (13.16)	4 (6.06)	
Prematurity	9 (8.65)	4 (10.53)	5 (7.58)	
Intrauterine growth retardation	8 (7.69)	3 (7.89)	5 (7.58)	
Perinatal asphyxia	5 (4.81)	2 (5.26)	3 (4.55)	
Congenital defects	5 (4.81)	3 (7.89)	2 (3.03)	
Connate pneumonia	5 (4.81)	5 (13.16)	0 (0.00)	
Low birth weight	5 (4.81)	2 (5.26)	3 (4.55)	
Other	15 (14.42)	5 (13.16)	10 (15.15)	
Stay/permanence with the mother				
Yes	128 (58.18)	82 (74.55)	46 (41.82)	0.000*
No	92 (41.82)	28 (25.45)	64 (58.18)	
Discharged				
Yes	128 (58.18)	82 (74.55)	46 (41.82)	0.000*
No	92 (41.82)	28 (25.45)	64 (58.18)	
Admission to neonatology				
Yes	96 (43.64)	30 (27.27)	66 (60.00)	0.000*
No	124 (56.36)	80 (72.73)	44 (40.00)	

Note: * significant differences in the p-value ratios <0.05, based on the chi-square statistic homogeneity test.
Source: medical records and collection datasheet.
Elaboration: Authors (2020).

Figure 1. Multivariate relationship of groups of national and foreign mothers.

Note: Based on the multivariate analysis of Categorical Main Components (CATPCA).
Source: medical records and collection data sheet
Elaboration: Authors (2020).

4. Discussion

Talking about immigration is always a complicated topic, a problem of many facets, some without a new solution. In the discussion, it will analyze some of the results found, trying to focus on the question of the complications of children born of immigrant mothers in Ecuador. The circle of immigrant poverty includes unplanned and forced travel, arrival in transit or final country where you cannot find adequate work, reduced economic income, impaired nutritional status, and direct health complications.

Transit and destination country

It classifies destination country often as a host country, while the transit country is an intermediate country on the road between the country of origin and the country of destination. It is not always a geographical intermediate. Ecuador is both a transit and destination country for immigrant women, mainly from Venezuela. This way is due to our dollarized economy, free access to the healthcare system, and the tradition that Ecuador is a friendly country of foreigners. These conditions increase the burden of care in the health system, especially for an immigrant population that causes an imbalance in demand for health access. Also, immigrant mothers come with inadequate control of pregnancy, due to the long road they travel to their destination. Travel conditions are also risk factors. Pregnant immigrant women come in shapes of poverty, accompanied by other children, family, and friends that complement a particular family group, and that, of course, makes living conditions difficult. Although in most cases, they migrate in search of a relative or close friend, there are cases of people traveling alone with no one to turn.

Occupation and work

The first problem when arriving in a host country is the search for a job/work/occupation that allows self-support to an immigrant family. Occupation refers to the scope of services that involves employment, salaried work, the assistance of an employer or the profession, action, or action or function that is performed to earn the livelihood that generally requires specialized knowledge. The occupation indirectly determines neonatal complications due to immigration. Situation force to some immigrant pregnant women to get temporary work and they cannot get a permanent job, with poor working conditions, and lower wages than usual. Type of work also influences in complications that pregnant women show. Therefore, in specific positions, the adaptation and improvement of working conditions must be an immediate task to carry out. It linked to the activity of the pregnant worker all activities that may involve fetal injuries or cause a placental abruption. In particular, shocks, vibrations or movements, manual handling of heavy loads that pose risks, particularly back-lumbar, noise, non-ionizing radiation, extreme cold and heat, gestures and postures, displacements, both inside and outside the workplace, mental and physical fatigue and other physical burdens. All this depends on the type of work that pregnant women do. It showed that immigrant pregnant women performed occasional day-job compared to local pregnant women who perform permanent work.

Income and salary

Inappropriate and temporary work causes more poverty, and which, in turn, can generate problems during pregnancy and a more significant number of neonatal complications. Most of the immigrant mothers had a salary between 61 to 400 USD per month. This salary serves to support a whole family, up to five people. The basic family basket in Ecuador stood at an average of USD 715, which means that with that salary, it would not reach to feed an entire family. Besides, as a direct consequence, there will be a nutritional deficit.

Nutritional status

An inadequate nutritional status, in both preconception and during pregnancy, it will hurt the ability to carry out that pregnancy and on the health of the mother and child. It recommends an average intake of 300 kcal more for the entire pregnancy, that is, an approximate daily intake of between 2150 kcal and 2200 kcal. During the first quarter, the total energy expenditure is not modified as much as in the second and third quarters if higher caloric intake is necessary, approximately 340 kcal per day in the second quarter and 425 kcal per day in the third. The local women fed three and four times during the day during pregnancy. It means, they required a caloric contribution between 2200 and 2900 kcal, compared to the foreigners who made it in a smaller percentage twice and three times a day, that means that their caloric intake was between 1460 and 2200 kcal, with a direct effect in neonatal development.

About maternal age

Maternal age is always a risk factor for the fetus and its postnatal stage. In this study, it found 3% of teenage pregnancies and 6% of pregnancies in women over 35 years. Teen pregnancy is a Public Health problem throughout Latin America. Immigrant women are also teenagers, with all that this means. Pregnancy exposes mother and fetus to the probability of getting sick or dying, primarily before age 18 and after age 35 is associated with an increased maternal and perinatal risk. It relates adolescent pregnancy to more complications during pregnancy and childbirth, which is aggravated because adolescents do not seek or receive adequate prenatal care. The probability of dye during pregnancy and childbirth in adolescents exceeds five to seven times that of women between 20 and 24 years. The most common complication in adolescent women is the threat of abortion, premature rupture of membranes, and oligohydramnios. These complications are associated with childbirth, dysfunctional labor, and perineal tears, difficulties in the puerperal stage, anemia, urinary tract infection, uterine atony, and endometritis. All this is a result of poorly constituted homes, single mothers, without adequate family communication, with a low educational level, where there is no importance to sex education. It relates to late pregnant women that are mothers over the age of 35, with hypertensive disease of pregnancy, premature rupture of membranes, and gestational diabetes. Also, children of mothers with gestational diabetes have two to six times the risk of fetal defects. The most common newborn complications are low birth weight, prematurity, death, increased risk of neonatology admission, respiratory distress syndrome, perinatal asphyxia, APGAR less than seven a minute and five minutes, and finally, neonatal mortality.

Prenatal controls during pregnancy

Immigrant mothers had fewer prenatal checkups than local mothers did. It is difficult to determine if those few prenatal controls were appropriate. Upon arrival in Ecuador, pregnant women must complete a procedure to access the Ecuadorian health system. This procedure can take several months, and in some cases, delay medical care. Besides, the effects of unexpected travel can cause stagnant pregnancy development. Incomplete prenatal controls, that is, less than four controls, were also associated with neonatal complications. It explained this factor because inadequate prenatal care that could trigger complications at birth, uniquely when they are not identified and treated early. Also, it is not always possible to complete the prenatal care protocol. It includes the correction of modifiable risk factors such as control of urinary tract infection, vaginosis, and rupture of membranes, chorioamnionitis, preeclampsia and complications at birth or in the first 24 hours of the life of the newborn. These indicators are essential, as they link to the most vulnerable moments in people's lives. Despite the significant efforts made in the country, morbidity and mortality rates in the neonatal period remain high. Although a clear downward trend in these rates has become evident in the last decade, it is necessary to optimize the institutionalization of public policies, strengthen healthcare services and improve the conditions and quality of life of the population.

Infections in pregnancy

The infection of the urinary tract was the most common in both groups analyzed. In pregnancy, UTIs are related to prematurity, transient tachypnea of newborn, hyperbilirubinemia, hyaline membrane disease, and connate pneumonia. Bacterial metabolism products of these infections stimulate decidua and cause the release of proinflammatory cytokines, prostaglandins, and interleukins that trigger preterm birth and produce a fetal inflammatory response syndrome. All this, together with the ascending spread of the infection, causes a weakening of the ovular membranes leading to premature rupture of the layers and chorioamnionitis. It could control infections with adequate and timely prenatal control, and in many cases, the solution is simple.

Other pregnancy problems

Premature rupture of membranes relates to respiratory stress syndrome, hyaline membrane disease, and other complications such as intraventricular hemorrhage, enteritis, omphalitis, pulmonary hypertension, and anemia of the newborn. In these cases, the fetus exposes to potentially pathogenic microorganisms present in the birth canal, significantly increasing the possibility of a connate infection, as previously cited. Preeclampsia also influences the health status of the newborn, increasing the likelihood of preterm birth with respiratory stress and hyaline membrane disease in the infant. There is a relationship between transient tachypnea of the infant, perinatal asphyxia, transient neonatal hypoglycemia, and polycythemia. In the newborn of a mother with preeclampsia, real toxigenic fetus pathology occurs, with alterations that affect the growth and homeostasis of the fetus and the newborn. Besides, iatrogenic prematurity is frequent when interrupting pregnancy for a maternal benefit, or due to its influence on the appearance of abruptio placentae. Therefore, multiple diseases can occur, such as icterus, respiratory disorders, connate infections, and congenital defects. Various factors give rise to these entities, including failures in prenatal control, maternal diseases, and inadequate attention to childbirth, which play a crucial role in increasing neonatal morbidity. Other maternal-perinatal factors that alter the neonatal adaptation to extrauterine life are prematurity, low birth weight, perinatal hypoxia, pregnancy-related diseases, intrauterine infections, drugs and drug use, congenital defects, and inherited diseases.

Limitations

Although the sample size is sufficient, a larger sample is always necessary. It carried out this research in public hospitals, and it would be needed to expand to private hospitals and other healthcare institutions. Another limitation was that, when obtaining the information from the medical records, there could have been a significant inter-observer variability, when interpreting the data and collecting it in the clinical history.

Generalization

It is possible to generalize this research, with a prospective design and including a larger sample and with public and private hospitals.

5. Conclusion

Children born from immigrant mothers have a higher number of neonatal complications. Most immigrant mothers arrive in conditions of poverty and get occasional and temporary jobs that allow them to earn an income of between 30 to 400 USD per month. This low income has a direct effect on the nutritional status of the mother and the fetus. Additionally, these mothers have a lower number of prenatal, low quality, and more connate infections. The circle of immigrant poverty includes

unplanned and forced travel, arrival in transit or final country where they cannot find adequate work, reduced economic income, impaired nutritional status, and direct health complications.

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Conflict of Interest

None declared

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