

Maternal Age And Folic Acid Intake Associated With Non-Syndromic Clefts Of The Lip And Palate In Term Newborns.

Américo Munayco^{1,2}, María Cortez^{1,2}, Nadia Meneses^{1,2}, Adrián Mallma^{1,2},
Diana Yataco², Rosmery Rubina^{2,3}, Maryjose Lapa^{2,3}, Oscar Sotomayor^{1,2}

Professor At The Faculty Of Dentistry, Universidad Nacional Federico Villarreal, Lima, Peru
Community Of Knowledge Sustainable Innovation In Dentistry, Universidad Nacional Federico Villarreal,
Lima, Peru

Undergraduate Student Faculty Of Dentistry, Universidad Nacional Federico Villarreal, Lima, Peru

Abstract:

Background: To determine whether maternal age and folic acid intake are associated with non-syndromic clefts of the lip and palate in full-term neonates.

Materials and Methods: The statistics and informatics office of the INMP provided the medical records of neonates born at term to select non-syndromic newborns with cleft lip and palate (case group) according to ICD-10 classification. And, neonates born at term on the same date without a diagnosis of cleft lip and palate ICD-10 (control group). For the variables, risk factors were obtained from the medical records of the case-control group.

Results: It was found that the most prevalent pathology according to ICD-10 classification was Q37.4 (20.8%) followed by Q37.0 and Q37.9 (13% and 11.7% respectively). And, the sex variable was independent of the non-syndromic and healthy group ($p=0.575$). The antecedent risk factor for cleft was statistically significant ($p=0.037$). In other words, mothers who have had a history of cleft have a 5.2% chance of presenting this pathology. Likewise, we see that mothers who have not consumed folic acid have a 44.2% probability of presenting this pathology, but it does not represent statistical significance ($p=0.086$). The logistic regression model did not find significance less than 0.05 in the risk factors evaluated. However, we observed that pregnant women who did not consume folic acid had 3.5 more times to develop cleft lip and palate in their children, but this did not represent statistical significance ($p=0.084$). And, the prediction of this pathology is 25.8% (Nagelkerke R²).

Conclusion: Maternal age and non-consumption of folic acid were not risk factors in pregnant women for cleft lip and palate in their full-term infants. And, the most prevalent pathology according to ICD-10 classification was Q37.4.

Key Word: full-term births, cleft lip and palate, folic acid, maternal age.

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I. Introduction

Orofacial clefts are the most common birth defect worldwide. The etiology of the fissure appears to be multifactorial, with genetic and environmental components. Although periconceptional folic acid supplementation has been shown to protect against neural tube defects, current evidence of its role in cleft lip prevention is mixed with few studies from low- and middle-income countries. (Mendonca, 2019)

Clefts of the lip-palate (CLP) are the most common congenital craniofacial deformities, resulting from incomplete fusion of the facial buds in early pregnancy. Despite its frequency and age, the etiology of this pathology has only been partially explained to this day. However, it has been recognized that several factors are involved. Genetic and environmental factors, as well as their interactions, have been implicated in the etiology of CLP.

The mechanisms that could potentially explain this incomplete fusion of facial breakouts are quite complex. (François-Fiquet et al., 2014)

The effects on speech, hearing, appearance, and psychology can lead to long-lasting adverse outcomes for health and social integration. Children with these disorders typically need multidisciplinary care from birth to adulthood and have higher morbidity and mortality across the lifespan than unaffected individuals. (Mossey et al., 2009)

Currently, there are few articles on the variables to be studied, both nationally and internationally, so

this study aims to answer the following question: Are maternal age and folic acid consumption associated with non-syndromic clefts of the lip and palate in neonates born at term?

II. Material And Methods

Spatial and temporal scope of the study. Data collection for this study began in August 2022, at the newborn immediate care center of the Delivery Unit of the Department of Neonatology of the INMP. The sample consisted of neonates born at term who presented the diagnosis of some type of non-syndromic cleft lip and palate (case group). And, neonates born at term without cleft lip and palate (control group). The type of research is comparative and observational, there will be no intervention of the researcher. The design of this study is retrospective and cross-sectional, since the variables to be studied will be measured in a single period of time. authorization was requested from the statistics and informatics office of the National Maternal Perinatal Institute (INMP), who provided us with information on the medical records of the newborns. Neonates with a diagnosis of cleft lip and palate were selected. We will then select the newborns born at term and divide it into two groups. Case group (presence of non-syndromic clefts of the lip and palate) and control group (absence of non-syndromic clefts of the lip and palate) coinciding in the date of birth in both groups. Subsequently, data on variables such as folic acid consumption and gestational age will be recorded from the mothers' medical records.

III. Result

Table 1: Distribution and frequency in non-syndromic (case) and healthy (control) newborns according to cleft lip and palate diagnoses and sex

			groups		Total	*Sig.
			no sindrónico (caso)	Sanos (control)		
Dx Cie-10	Q37.4	n (%)	16 (20,8%)	0 (0,0%)	16 (20,8%)	,000
	Q37.0	n (%)	10 (13,0%)	0 (0,0%)	10 (13,0%)	
	Q37.5	n (%)	2 (2,6%)	0 (0,0%)	2 (2,6%)	
	Q35.8	n (%)	1 (1,3%)	0 (0,0%)	1 (1,3%)	
	Q37.9	n (%)	9 (11,7%)	0 (0,0%)	9 (11,7%)	
SANOS		n (%)	0 (0,0%)	39 (50,6%)	39 (50,6%)	
sexo	masculino	n (%)	20 (26,0%)	23 (29,9%)	43 (55,8%)	,575
	femenino	n (%)	18 (23,4%)	16 (20,8%)	34 (44,2%)	

The most prevalent pathology according to ICD-10 classification was found to be Q37.4 (20.8%) followed by Q37.0 and Q37.9 (13% and 11.7% respectively). And, the sex variable was independent of the non-syndromic and healthy groups (p=0.575)

Table 2: Distribution and frequency in non-syndromic (case) and healthy (control) births according to risk factors.

			GRUPOS		Total	*Sig.
			no sindrónico (caso)	Sanos (control)		
cdn	≤5	n (%)	21 (27,3%)	21 (27,3%)	42 (54,5%)	,901
	>5	n (%)	17 (22,1%)	18 (23,4%)	35 (45,5%)	
abortos	0	n (%)	25 (32,5%)	26 (33,8%)	51 (66,2%)	,688
	1	n (%)	10 (13,0%)	9 (11,7%)	19 (24,7%)	
	2	n (%)	2 (2,6%)	3 (3,9%)	5 (6,5%)	
	3	n (%)	1 (1,3%)	0 (0,0%)	1 (1,3%)	
	4	n (%)	0 (0,0%)	1 (1,3%)	1 (1,3%)	
itu	no	n (%)	35 (45,5%)	39 (50,6%)	74 (96,1%)	,073
	si	n (%)	3 (3,9%)	0 (0,0%)	3 (3,9%)	
consumo de ácido fólico	no	n (%)	34 (44,2%)	29 (37,7%)	63 (81,8%)	,086
	si	n (%)	4 (5,2%)	10 (13,0%)	14 (18,2%)	
consumo de medicamentos	≤12 sem	n (%)	6 (7,8%)	4 (5,2%)	10 (13,0%)	,443
	>12 sem	n (%)	1 (1,3%)	0 (0,0%)	1 (1,3%)	
	no consumo	n (%)	31 (40,3%)	35 (45,5%)	66 (85,7%)	
antecedente de fiebra	no	n (%)	34 (44,2%)	39 (50,6%)	73 (94,8%)	,037
	si	n (%)	4 (5,2%)	0 (0,0%)	4 (5,2%)	
riesgo edad materna (años)	alto riesgo (<19)	n (%)	2 (2,6%)	4 (5,2%)	6 (7,8%)	,694
	bajo riesgo (19-34)	n (%)	29 (37,7%)	29 (37,7%)	58 (75,3%)	
	alto riesgo (≥ 35)	n (%)	7 (9,1%)	6 (7,8%)	13 (16,9%)	

Statistical significance was found in the risk factor of history of fissure ($p=0.037$). It is accepted that mothers who have had a history of fissure have a 5.2% probability of presenting this pathology. Likewise, we see that mothers who have not consumed folic acid have a 44.2% probability of presenting this pathology, but this does not represent statistical significance ($p=0.086$).

Table 3
Association between risk factors for cleft lip and palate development using an explanatory logistic regression model.

Factores de riesgo	B	Error estándar	Wald	gl	Sig.	Exp(B) Odds ratio	95% C.I. para EXP(B)	
							Inferior	Superior
riesgo edad materna	-,918	,776	1,401	1	,236	,399	,087	1,826
cpn	-,128	,529	,058	1	,810	,880	,312	2,485
Dx Cie-10	,094	,134	,489	1	,484	1,098	,844	1,429
consumo de ácido fólico	1,279	,740	2,991	1	,084	3,594	,843	15,317
consumo de medicamentos	,315	,411	,586	1	,444	1,370	,612	3,067
antecedente de fisura	-21,733	18841,130	,000	1	,999	,000	,000	.
abortos	-,035	,337	,011	1	,917	,965	,499	1,868
itu	-21,151	23152,211	,000	1	,999	,000	,000	.

The logistic regression model did not find significance less than 0.05 in the risk factors evaluated. However, we observed that pregnant women who did not consume folic acid are 3.5 times more likely to develop cleft lip and palate in their children, but this does not represent statistical significance ($p=0.084$). And, the prediction of this pathology is 25.8% (R2 of Nagelkere).

IV. Discussion

This study conducted at the National Maternal and Perinatal Institute (INMP) aimed to determine whether maternal age and folic acid consumption are associated with non-syndromic cleft lip and palate in full-term neonates. Cleft lip and palate have been divided into three categories; those affecting only the lip, those affecting only the palate, and those affecting both the lip and palate (Leslie and Marazita, 2013). Cleft lip and/or cleft palate are often isolated non-syndromic occurrences; however, when associated with other abnormal physical findings, a recognizable syndrome may be present (Merritt, 2005).

Plasencia-Dueñas. 2020.PERU in its study carried out in Lima-Peru 2020 found the most frequent pathology to be cleft lip and palate with complete extension and in males (59%). Our study is similar in the type of pathology, but not in frequency, since the reported pathology was Cleft of the hard palate and soft palate with bilateral cleft lip Q37.4 (20.8%) and the sex was independent of the non-syndromic and healthy group ($p=0.575$). These differences in frequency could be due to the sample size and formulated objectives of both studies. In addition, we report as frequent pathology Q37.0 Cleft of the hard palate with bilateral cleft lip (13%) and, Q37.9 Cleft of the palate with unilateral cleft lip (11.7%). Likewise, it disagrees with what was reported by Mejía. 2012 where 64.1% of those diagnosed with cleft lip and palate were male.

Statistical significance was found in the risk factor history of cleft ($p=0.037$). It is accepted that mothers who have had a history of cleft lip and palate have a 5.2% chance of presenting this pathology. Likewise, we see that mothers who have not consumed folic acid have a 44.2% chance of presenting this pathology, but this does not represent statistical significance ($p=0.086$).

The logistic regression model did not find significance less than 0.05 in the risk factors evaluated. However, we observed that pregnant women who did not consume folic acid are 3.5 times more likely to develop cleft lip and palate in their children, but this does not represent statistical significance ($p=0.084$). And, the prediction of this pathology is 25.8% (R2 of Nagelkere)

V. Conclusion

Maternal age and lack of folic acid consumption were not risk factors for pregnant women to present cleft lip and palate in their full-term babies.

The most prevalent pathology according to ICD-10 classification was Q37.4 followed by Q37.0 and Q37.9. And, the variable sex was not significant.

The risk factor of history of cleft was statistically significant. That is, mothers who have had a history of cleft have a 5.2% probability of presenting said pathology. Likewise, we see that mothers who have not consumed folic acid have a 44.2% probability of presenting said pathology, but it does not represent statistical significance.

The logistic regression model did not find statistical significance in the risk factors evaluated. However, we observed that pregnant women who did not consume folic acid are 3.5 times more likely to develop cleft lip and palate in their children, but this is not statistically significant. And the prediction of this pathology is 25.8% (R2 of Nagelkere).

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