



Salud Pública de México

ISSN: 0036-3634

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Instituto Nacional de Salud Pública  
México

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Period prevalence and anthropometric predictors of premature rupture of membranes in  
Mexican women, 2009-2012  
Salud Pública de México, vol. 59, núm. 2, marzo-abril, 2017, pp. 122-123  
Instituto Nacional de Salud Pública  
Cuernavaca, México

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### Period prevalence and anthropometric predictors of premature rupture of membranes in Mexican women, 2009-2012

*Dear editor:* The premature rupture of membranes (PROM) represents a health problem with an increased risk of infection and complications to mother and baby. PROM may result from various reasons including low socioeconomic status (SES), intraamniotic infection, second and third-trimester bleeding, nutritional disorders of copper and ascorbic acid, connective tissue disorders, cervical conisation or cerclage, pulmonary diseases, uterine overdistention, amniocentesis, previous preterm birth, short cervical length in the second trimester, women with preterm labor or symptomatic contractions in the current pregnancy.<sup>1</sup>

In this letter to the editor we show the results of a case-control study on the association between anthropometric characteristics and PROM in Mexican pregnant women attending the emergency room of Mónica Pretelini Hospital in Toluca, Estado de México between 2009 and 2012. A total of 13 681 women were seen with an overall PROM prevalence of 4.5% (620 cases with PROM, and 13 061 controls without PROM nor conditions associated with PROM). The preterm PROM (PPROM) prevalence was 5.5%. Cases

and controls were similar with regard to mean age, height, respiratory rate, heart rate, body temperature and blood pressure (table I). PROM cases were 32% more likely to have a pregnancy of less than 37 weeks of gestation compared to controls. A 1-Kg lower maternal weight was associated with 1% increased risk of PROM in all women and for each gestational week less, the risk increased 5% ( $p < 0.05$ , tables II and III).

A previous Mexican study from Sinaloa<sup>2</sup> showed PPRM prevalence of 8.9% which is higher than our 5.5% estimate. The differences in estimates of prevalence might be partially explained by selection bias or sample size, for instance, the control group in our study was about ten times larger than the control group in the Sinaloa's study. Our report is the first study showing the association between lower maternal weight during pregnancy and PROM in Mexican pregnant women. Previous studies showed that PPRM cases were more likely to have gained less than 21 pounds as compared to controls.<sup>3</sup> These findings may indicate suboptimal nutritional status with deficiencies that put pregnant women at risk

of PROM. For instance, low plasma levels of copper<sup>4</sup> or vitamin C<sup>5</sup> have been associated with the presence of PROM. Vitamin C plays an important role in collagen metabolism and increases resistance maintenance of the chorioamniotic membranes. At the molecular level, PROM appears to result from diminished collagen synthesis, altered collagen structure, and accelerated collagen degradation, possibly in association with concurrent cellular changes within the fetal membranes.

In the present study, SES indicators were not available, which represent a potential confounder, however, a previous Mexican study<sup>2</sup> showed no differences due to SES between PROM cases and controls. This may be explained by the type of population, in both Mexican studies pregnant women seeking attention usually come from the low SES because both hospitals are government hospitals under the Ministry of Health which serve the underserved. Future studies in Mexican women are needed to determine whether patients with PROM have specific deficiencies of vitamin C, copper or other nutritional disorders.

**Table I**  
**CHARACTERISTICS OF PROM CASES AND CONTROLS,**  
**MEAN (STANDARD DEVIATION) AND RANGE**

	Cases (PROM*) n=620	Control group n=13061	p-value by t-test	Total n=13 681
Age (years)	23.7 (6.1) 14-44	23.3 (6.2) 13-44	0.08	23.3 (6.2) 13-44
Height (meters)	1.55 (0.06) 1.40-1.73	1.55 (0.06) 1.40-1.76	0.55	1.55 (0.06) 1.40-1.76
Weight (kilograms)	67.2 (10.3) 45-101.5	67.9 (10.5) 45-104	0.07	67.9 (10.5) 45-104
Weeks of gestation	37.0 (2.97) 28-42	37.5 (2.93) 28-42	<.001	37.5 (2.9) 28-42
Respiratory rate (per min)	20.8 (2.2) 16-32	20.6 (2.2) 15-40	0.12	20.7 (2.2) 15-40
Heart rate (per min)	82.3 (9.4) 58-140	81.7 (8.8) 50-168	0.14	81.1 (8.9) 50-168
Body temperature (°C)	36.3 (0.37) 35-38	36.3 (0.37) 35-40	0.58	36.3 (0.37) 35-40
Systolic blood pressure (mm Hg)	115 (13.8) 80-170	114 (13.5) 60-170	0.12	114 (13.5) 60-170
Diastolic blood pressure (mm Hg)	71.8 (10.4) 40-110	71.4 (10.3) 40-136	0.37	71.4 (10.3) 40-136

\* Premature rupture of membranes

Source: Electronic database of the Emergency Department, Mónica Pretelini Sáenz Hospital

**Table II**  
**UNIVARIATE ANALYSIS OF WOMEN CHARACTERISTICS**  
**AND SEASONALITY BY GROUP**

	Cases (PROM*)		Controls		p-value	OR	95% CI	Total	
	n=620		n=13 061					n=13 681	
	n	%	n	%				n	%
Age group (years)									
31+	100	5.0	1 910	95.0	0.30	1.12	0.90-1.4	2 010	14.7
13-30	520	4.5	11 151	95.5		1.00	referent	11 671	85.3
Weeks of gestation									
<37	217	5.5	3 757	94.5	<0.001	1.33	1.12-1.58	3 974	29.0
≥37	403	4.2	9 304	95.8		1.00	referent	9 707	71.0
Body mass index									
Underweight (<18.5)	1	12.5	7	87.5	0.24	1.09	0.84-1.41	8	0.1
Normal (18.5-24.9)	146	4.9	2 815	95.1	0.17	1.17	0.93-1.46	2 961	21.6
Overweight (25-29.9)	298	4.5	6 294	95.5	0.50	1.00	0.99-1.01	6 592	48.2
Obese (≥30)	175	4.2	3 945	95.8		1.00	referent	4 120	30.1
Obese I (30-34.9)	144	4.3	3 168	95.7	0.47	1.16	0.76-1.77	3 312	24.2
Obese II (35-39.9)	27	3.8	692	96.2		1.00	referent	719	5.3
Obese III (40+)	4	4.5	85	95.5	0.72	1.00	0.96-1.05	89	0.7
Year of visit to ER <sup>‡</sup>									
2009	130	4.2	2 996	95.8	0.87	1.02	0.79-1.30	3 126	22.8
2010	192	5.3	3 444	94.7	0.01	1.30	1.04-1.64	3 636	26.6
2011	161	4.5	3 402	95.5	0.37	1.11	0.88-1.40	3 563	26.0
2012	137	4.1	3 219	95.9		1.00	referent	3 356	24.5
All years	620	4.5	13 061					13 681	
Season									
Fall	190	5.0	3 594	95.0	0.12	1.18	0.95-1.47	3 784	27.7
Winter	130	4.6	2 718	95.4	0.55	1.07	0.84-1.36	2 848	20.8
Spring	146	4.3	3 289	95.7	0.98	0.997	0.79-1.25	3 435	25.1
Summer	154	4.3	3 460	95.7		1.00	referent	3 614	26.4

\* Premature rupture of membranes

‡ Emergency Room

Source: Electronic database of the Emergency Department, Mónica Pretelini Sáenz Hospital

**Table III**  
**MULTIVARIABLE ANALYSIS SHOWING ASSOCIATED FACTORS OF PROM**

	aOR*	95% CI	p-value
Age (years)	1.01	1.00	1.026
Height (meters)	----	----	----
Weight (kilograms)	0.99	0.98	0.998
Weeks of gestation	0.95	0.93	0.977
Respiratory rate (per min)	----	----	----
Cardiac rate (per min)	1.01	1.00	1.015
Body temperature (°C)	----	----	----
Systolic blood pressure (mmHg)	1.01	1.00	1.011
Diastolic blood pressure (mmHg)	----	----	----
Fall	1.15	0.96	1.370
Year of 2010	1.22	1.02	1.451
<37 weeks of gestation <sup>‡</sup>	1.32	1.11	1.558

\* aOR adjusted odds ratios using backward elimination procedure set to 0.2 significance level

‡ A separated multivariable logistic regression analysis including weeks of gestation as an indicator variable (≤ 37 weeks=1; else =0) after controlling by all other variables in the model.

Source: Electronic database of the Emergency Department, Mónica Pretelini Sáenz Hospital

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## Violencia de pareja en la gestación y el perfil del autor de la agresión

Señor editor: La violencia contra la mujer es un problema complejo que compromete el desarrollo pleno e integral de las mujeres en Brasil y en el mundo, la cual llega a ser aún más grave cuando ocurre en mujeres durante el periodo de gestación, lo que trae un riesgo adicional para la vida intrauterina de su hijo.<sup>1</sup>