

The epidemic of the cesarean section in private hospital in Puebla, MÃ©xico

Abstract

The world health organization established that there are no valid justifications to perform more than 15% cesarean surgeries. The Mexican official norm establishes that cesarean section could be between 12-17%.

Objective: Determine the real incidence of cesarean interventions in México and the factors associated with it.

Methods: Sociodemographic data's from 504 women attended in public and private hospitals in Puebla City were collected.

Results: There has been a significant, out of the norm limits, an increment in the cesarean surgery in México, reaching up to 57.3 % of all deliveries, notably the cesarean section reaches up to 85.6% in private hospitals. We also found that the cesarean decision significantly correlates with the age, socioeconomic status and scholar mother's degree.

Conclusion: It is important to evaluate what is happening and the factors associated with these numbers in Mexico, and to take corrective measurements oriented to decrease the number of cesarean deliveries that implies a well-known risk for both the mother and the baby.

Keywords: age, education level, economic status, public or private health system, cesarean

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Elena Soto Vega,^{1,2} Urrutia-Osorio Marta,¹ Arellano-Valdez Fernando,¹ Lopez Begines Iliana Yazmin,¹ Hernyndezer Romero Christian Hazel¹

¹Departamento de Ciencias de la Salud, Universidad Popular Autónoma del Estado de Puebla, México

²Centro de Investigación, Una Nueva Esperanza A.B.P, México

Correspondence: Elena Soto Vega, Universidad Popular Autónoma del Estado de Puebla, 21 sur 1103. Barrio de Santiago, C.P 72410, Puebla, México, Tel 52 (222) 2299400, ext. 7140, Email elena.soto01@upaep.mx

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Introduction

The cesarean section is the most common major surgical procedure performed in the world. The World Health Organization has established that there are no valid justifications to perform cesarean section in more than a 10-15%¹ of the cases. As a matter of fact, the Mexican official norm (NOM-007-SSA2-1993) states as a correct ratio between 12-17%.^{2,3} However, nowadays cesarean section is being performed much more frequently, reaching high numbers worldwide.⁴ Until 2012, México was the country with higher number of cesarean section in the world, reaching a total of 45.2%.⁵ It is worth to note cesarean practice in the private medical practice reach up to 69.8%.⁵

The cesarean section poses short and long term health risk to the mother and infants. A cesarean section procedure has precise indications and these are divided in the elective and urgent indications. The elective ones are: placenta previa, two previous cesarean section (iterative cesarean section), maternal risk factors harmful to the fetus (HIV), cephalopelvic disproportion, breech presentation, transverse lie, among others. The urgent indications are: dystocia, fetal distress, cord prolapse, placental abruption, ruptured vasa and poor maternal status.⁶

The cesarean section rate has become more prevalent over the years without a clear medical justification and regardless it is associated with an increase in morbidity and mortality of mothers and children. Cesarean is associated with adverse effects such as: maternal death, emergency hysterectomy, thromboembolic events, wound infections, reduced fertility, prolonged hospital stay with greater number of hospital readmissions, problems with physical recovery and chronic pelvic pain.⁷⁻⁹ Adverse effects to the newborns are less well documented; but the evidence suggests an increase of the respiratory distress syndrome after a cesarean. In addition, there

are chronic diseases that occur more frequently in children born by a cesarean section such as: asthma, type 1 diabetes and allergic rhinitis. It also has to be taken into consideration the public costs in health that are made by these surgical procedures. A study by González Pérez et al.¹⁰ showed that the costs of the excessive number of cesarean section performed in Jalisco, México exceed several millions of dollars annually, having a significant effect on the economy.¹⁰

Regardless of these facts, cesarean section has some medical advantages over vaginal delivery like the less vasion of labor pain, the selection of delivery schedule, and finally the lower prevalence of urinary incontinence. Another maternal and obstetric factors that insides in the increase of the cesarean rate are the older maternal age, the greater weight gain during pregnancy, obesity and the higher prevalence of nulliparity.^{11,12}

Although there are studies that attempt to explain the clinically and economically significant increase in cesarean section as seen above, we lack sufficient demographic studies that allow us to accurately define the factors that are contributing to increase the cesarean section in Mexico. With the aim to understand the causes of the cesarean section rate, we analyzed the influence of age, scholar degree, medical system (public-private) and economic income.

Material and methods

Data were collected from 5 different public and 3 private hospitals in Puebla, México, from November 2013 to February 2014. A total of 517 mothers agreed to participate; however, 13 were excluded (because of incorrect fulfill of survey). Of the 504 participants, 125 were from private hospitals and 379 from public hospitals.

Women were randomly selected and were interviewed immediately in the post-partum or post-cesarean period, during their

stay in the hospital. The survey contemplates the following variables: mother age, gestational weeks, economic income, educational level, and the clinical variables were: the type of lie and presentation of the fetus, previous cesarean sections or vaginal births, if there were any complications during pregnancy or during the postpartal period, We also obtained data, from the medical history, about the decision making on the way of delivery method and also about who sets indication for cesarean section.

The data were analyzed using graph pad 6, 2x2 contingency tables. Statistical differences between groups were done employing chi square test with Yate's correction. The relative risk (RR) and Odds ratio (OR) were calculated using the medcalc calculator with a confidence interval (CI) of 95%. The p value was statistically significant when p was ≤ 0.05 . The protocol was approved by the Ethicesarean section Committee of the Universidad Popular Aut3noma del Estado de Puebla, an informed consent was obtained from all the participants.

Results

The patient's age range was between 13 and 42 years old. The average age was 25.7 ± 6.1 years old; women attended in public hospitals were 24.7 ± 6.2 years old and those attended in private hospitals were 31.1 ± 6.6 years old, there was non-significant difference in age between groups. The data analysis showed that 57.3% of the women underwent cesarean section and 42.7% experienced vaginal birth. An important factor that should be taken into account in the choice between vaginal birth or cesarean section is the mother age, it is interesting that as mother's age increases the frequency of the vaginal birth decreases and the cesarean increases (Figure 1).

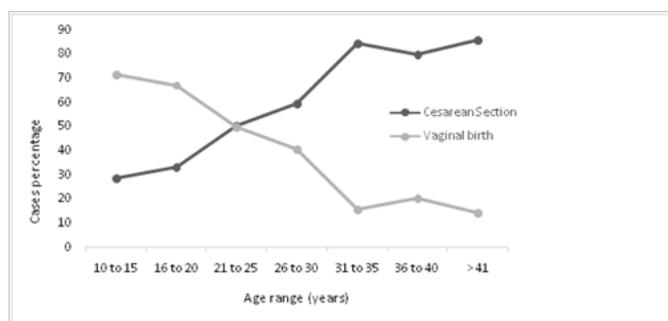


Figure 1 Relationship between the cumulative percentage of cesarean section (black line) or vaginal birth (gray line) realized according to the women age groups (n=504). Birth frequency is clearly biased towards younger age.

The next point was to evaluate the percentage of cesareans and vaginal delivery according to the health system in which the mother was attended. The public system has a similar percentage of vaginal birth versus cesarean section (52.2% vs 47.8%), while private hospitals have a significantly higher cesarean section percentage (14.4% vs 85.6%) ($p < 0.00001$). The difference in the cesarean section rate among public and private hospital is significantly different ($p < 0.0001$), being the cesarean section much more common in private hospitals.

We divided the population in two categories: women older or younger than 30 years old and the result showed a significant difference in the delivery method election, the cesarean section is significantly increased in the women older than 30 years old ($p < 0.0001$) RR=0.58 (0.51-0.66), OR= 0.19 (0.12-0.32). We also analyzed the risk of having cesarean section for those women attended in a private hospital, according to the age group (younger or older than 30 years) and we found a significant result ($p = 0.002$) with a RR=0.43 (0.32-

0.58), OR=0.08 (0.02-0.32) these results are similar to the results of the entire group (n=504) (Table 1). The gestational week's analysis showed no difference between women attended in public or private hospitals (38.3 ± 2.75 and 39.04 ± 2.40 respectively), dividing the group in younger or older than 30 there was no difference among gestational weeks.

Table 1 This table shows the percentage of women that underwent to a cesarean section (CS) or a vaginal birth (VB) in public or private system according to their age group (older or younger than 30)

Health system	Public (%)		Private (%)	
	CS	VB	CS	VB
Delivery method				
<30	38.26	49.44	33.06	12.9
>30	6.42	5.86	53.22	0.8

The medical records were reviewed to know the causes that led the cesarean decision, it was found that in public system 42.5 % were related to a medical emergency, meanwhile in private hospital only 16.7 % were considered an emergency, the rest of the cesareans were programmed, there are significant statistical differences between both systems in the frequency and the reason originating the cesarean ($p < 0.0001$). The most common indication for cesarean section was iterative cesarean and in this item mother's decision is the most frequent reason for the surgery (Table 2).

Table 2 Table of the percentage of the most common indications for cesarean surgery in private and public hospitals

Programmed cesarean section indication	Private hospital	Public hospitals
Iterative Cesarean	40.80%	38.50%
Abnormal lie or Presentation	13.20%	28.80%
Alterations of the Placenta and Umbilical cord	10.50%	8.70%
Fetal Abnormalities	9.20%	3.80%
Maternal Disease	10.50%	9.60%
Multiple Pregnancies	5.30%	2.90%

Maternal scholar degree was considered as a factor associated with the election of the delivery method and it was found that 93.3 % of the mothers with a PhD or a master elected a cesarean section (Table 3). We compared the group as professional women (PhD, master or bachelors) and non-professional women (high, junior or elementary school), we found that the risk of cesarean increases significantly as the scholar degree increases ($p < 0.001$) RR=1.70 (1.47-1.95) OR=4.27 (2.74-6.66). The Table 3 shows that the decision to be attended in a private hospital depends also of women scholar degree, those with PhD, master's or Bachelor prefer to deliver in a private hospital, so this increase the cesarean risk.

The monthly family income was also evaluated and 45.1% of the sample population have a monthly income considered as extreme poverty (0-230 USD per month) and only 10.7% earns over \$1150 USD considered high median or high income, all the women in this last rank were attended in a private hospital (n=54). When compared the monthly income between women attended at a private hospital and a public hospital the difference was found to be extremely statistically significant ($p < 0.0001$) (Table 4).

To evaluate if the economic income influences the decision of the delivery method, we divided the population according to the economic status in two groups: those with low income (low, medium,

poverty or extreme poverty) and those with high income (medium or high medium). The data indicate that there was a significant difference in the delivery method between both populations; in the group with a high income the cesarean section was significantly more frequent than in those considered as low income group ($p < 0.0001$) $RR = 0.54$ (0.48-0.6) and $OR = 0.07$ (0.03-0.17) and the difference also is reflected in the public health in which women is attended (Table 5).

Table 3 Relationship between scholarship and the decision of cesarean section in private and public hospitals

Scholarship	Private hospital (n = 125)		Public hospitals (n=379)	
	Cesarean	Vaginal birth	Cesarean	Vaginal birth
PhD	100	0	0	0
Master's	92.3	7.6	0	0
Bachelor	56.7	6.7	18.3	18.3
High School	6.7	4.4	43.4	45.6
Junior High	1.5	0.7	40.3	57.5
Primary School	0	0	56.6	43.4
None	0	0	42.9	57.1

Table 4 Difference in monthly family income of women that selected private or public hospitals, expressed in USD

Monthly family income	Private hospitals (%)	Public hospitals (%)
Extreme Poverty (\$0-230)	5.6	56.5
Poverty (\$230-\$460)	2	32.4
Low Medium (\$460-\$924)	25.2	11.1
Medium (\$924-\$1150)	23.2	0
High Medium (>\$1150)	44	0
Total	100%	100%

Table 5 Percentage of cesarean and vaginal birth according the income classification in private and public hospitals

Economic status	Private hospitals		Public hospitals	
	Cesarean	Vaginal birth	Cesarean	Vaginal birth
Extreme poverty	0.59	0.79	17.85	25.19
Poverty	0.39	0	13.29	10.51
Low Medium	4.76	1.58	4.76	3.57
Medium	5.55	0.19	0	0
High, Medium or High	9.9	2.57	0	0

Discussion

The prevalence in cesarean section has had a significant increase in the last years. In Mexico in 2012 the percentage of cesarean section was 45.2%, however nowadays we found that it has risen up to 57.3%, and in the case of private hospitals the percentage increases to an alarming number of 85.6%, which is one of the highest ever found in any previous survey in all the world.^{5,13-18} It is obvious that the increase in the cesarean section rates has not been satisfactorily faced by the health sector authorities in México.

The women age seems to be directly correlated with the selection of the cesarean section, increasing dramatically in those older than 30 years old and generally the decision for cesarean is taken by the mothers without medical reason, this result agrees with several studies worldwide that also shows that the mother's age is important in this decision.^{13,19}

The scholar degree seems to be very important in the selection of the delivery method; 93.3% of the mothers with a profession elected a cesarean. In China educated women were 3-4 times more likely to have a cesarean section as compared to illiterates.²⁰ Women may consider cesarean as less painful, convenient and safer option than vaginal birth.²¹⁻²⁴ Besides, the cesarean allows women to have certainty on the development of the birth, the modern medicine also contributes to the confidence of the most educated women, which is also an important factor to consider.

The result obtained with the analysis of the economic income is similar to other studies realized in countries like China, Brazil and Italy.^{20,25} It is understandable that women with a stable socioeconomic status prefers to be attended in the private sector to avoid all the administrative procedure in the public hospital that is also associated with a poor medical attention due to the quantity of women that each doctor has to attend daily.

The highest rate of cesarean section found in the private hospitals could be explained by the economic incentives to doctors, which are usually three times larger than those obtained with a vaginal birth, in a cesarean procedure in México a doctor could earn between \$1000-2900 USD in the private sector. However, economic incentives do not explain what happens in the public hospitals where doctors do not receive extra payment for performing a cesarean section. Our results are similar to those registered in Ethiopia, they found 3 times higher levels of cesarean in the private compared to public sector.¹⁸

Due to the increment observed in recent years of the cesarean section in Mexico, it is very important to develop a formal line of research to define what is happening, and propose a national delivery health law that warrants women to be well informed of their options and make an informed choice of the delivery method they desire. It is important to take into account the economic cost for the public health system of the increase in the cesarean section which means several millions of dollars spent annually on unnecessarily health services.

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Conflicts of interest

The authors declare there is no conflict of interests.

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