

Critical analysis of the benefits on normal birth in different positions¹

Analise crítica dos benefícios do parto normal em distintas posições

Análisis crítica de los beneficios del parto normal en distintas posiciones

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KEYWORDS: Obstetrics. Evidence-based practices. Position for birth. Perinatal Health.

ABSTRACT

This article is the summary of the paper awarded with the Prize Abrange in 2007. As there is no unanimity in medical approaches about how childbirth should be assisted in human beings, the author studies the process of birth comparing supine and squatting position for birth, adopting a theoretical framework with six independent variables- Role of gravity; Compression of the maternal *vasa*; Diameters of the channel of childbirth; Angle of fit of the presentation (drive angle); Lung ventilation and maternal acid-base balance; Efficiency of the uterine contractions (during labor and during the second stage) – and two dependent variables - loss of blood during birth and Apgar at the first minute. Loss of blood, measured by the differences in the means of hemoglobine and hematocrit before and after birth, was significantly lower in the position squatting-supine (when after birth the woman is invited to lie down). The proportion of babies with a higher Apgar score (> 8) at the first minute was significantly higher in the group of squatting position. And inversely, a significant lower proportion on newborns with lower Apgar score (0 the 6) was found when the mother was in the squatting position. Given these results, it is suggested that official and hospital protocols adopt this position as a recommendation and usual practice.

RESUMO

Este trabalho é vencedor do prêmio Abrange de 2007. Como não há unanimidade de critérios médicos sobre como devem ser atendidos os partos em seres humanos, o autor estuda o processo de nascimento comparando a posição supina com a vertical ou de cócoras, utilizando um modelo teórico com seis variáveis independentes - Ação da gravidade; Compressão dos grandes vasos maternos; Diâmetros do canal do parto; Ângulo de encaixe da apresentação; Ventilação pulmonar e equilíbrio ácido-básico materno; e Eficiência das contrações uterinas (no trabalho de parto e período expulsivo) - e duas variáveis dependentes, uma materna - perda de sangue – e outra neonatal – índice de Apgar ao primeiro minuto de vida. A perda sanguínea, medida pela diferença nas médias de hematócrito e na hemoglobina antes e depois do parto, foi significativamente menor na posição cócoras-supino (quando após o parto a mãe é convidada a deitar-se). A proporção de bebês com Apgar mais elevado (>8) ao primeiro minuto foi significativamente maior no grupo em que a posição para o parto foi de cócoras. E inversamente se obteve significativamente menor proporção de recém nascidos com Apgar baixo (0 a 6) nos partos com a mãe em posição de cócoras. Dados esses resultados, sugere-se que protocolos oficiais e hospitalares adotem essa posição como recomendação e prática rotineira.

1 Summary of the paper with the same title awarded with the Abrange Prize in 2007

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PALAVRAS-CHAVE: Obstetrícia. Práticas baseadas em evidências científicas. Posição de parto. Saúde Perinatal.

RESUMEN

Este trabajo es vencedor del premio Abramge de 2007. Como no hay unanimidad de criterios médicos sobre como deben ser atendidos los partos en seres humanos, el autor estudia el proceso de nacimiento comparando la posición supina con la vertical o de cuclillas, utilizando un modelo teórico con seis variables independientes - Acción de la gravedad; Compresión de los grandes vasos maternos; Diámetros del canal del parto; Ángulo de encaje de la presentación; Ventilación pulmonar y equilibrio ácido básico materno; y Eficiencia de las contracciones uterinas (en el trabajo de parto y período expulsivo) - y dos variables dependientes, una materna - pérdida de sangre - y otra neonatal - índice de Apgar al primer minuto de vida. La pérdida sanguínea, medida por la diferencia en las medidas de hematócrito y de hemoglobina antes y después del parto, fue significativamente menor en la posición cócoras-supino (cuando después del parto la madre es invitada a acostarse). La proporción de recién nacidos con Apgar más elevado (>8) al primer minuto fue significativamente mayor en el grupo en el que la posición para el parto fue de cuclillas. E inversamente encontramos significativamente menor recién nacidos con Apgar bajo (0 a 6) en los partos con la madre en posición de cuclillas. Debido a estos resultados, se sugiere que los protocolos oficiales y hospitalarios recomienden esa posición como práctica rutinaria.

PALABRAS-CLAVE: Obstetricia. Práticas basadas en evidencias científicas. Posición del parto. Salud Perinatal.

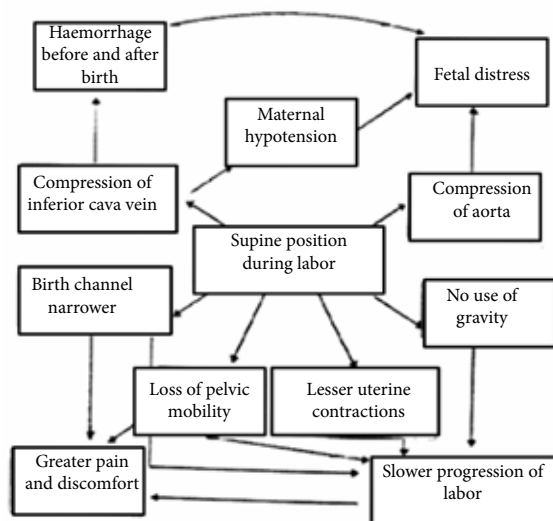
Introduction

There is no unanimity in medical approaches about how childbirth should be assisted in human beings. The position that the woman should adopt in the moment of the birth is still reason for great controversy^{1,2,3,4}.

For pregnant women without risk, in the great majority of the maternities the gynecological position is mandatory for the moment of the birth. This guideline has been generalized historically and, according to its supporters, produces good results in births^{5,6}.

On the other hand, there are evidences that, for women without any pregnancy risk, when they adopt a vertical or a squatting position in the moment of birth, the mechanisms of childbirth are respected, allowing more physiological births, with fewer maternal-fetus-neonatal complications^{7,8,9,10,11}. To propose the supine position as a routine for birth may compromise the process, as is shown in Figure 1¹².

Fig 1 - Consequences of the supine position during labor and birth (Dunn, 1976)



A better knowledge of this process, as well as on the positive or negative repercussion that a certain position may cause, as is shown by this paper, can help shape public policies of care for the whole population, about which is the most appropriate maternal position that a woman should adopt for a normal birth, in order to have a more humane birth, respecting the physiological processes of birth. Thus we are trying to decrease aggressive attitudes and inadequate practices that may be observed nowadays for the great majority of the population, including avoiding natural birth or performing unnecessary cesarean sections.

One of the specific objectives of the current paper was to analyze variables that are present in the moment of birth, here named independent variables, that might have potential maternal-fetal-neonatal benefits and quantify them when women are in the horizontal (supine) and vertical (squatting) position. A second objective consisted of identifying two dependent variables, a maternal one, blood loss, and another of the newly born, Apgar score at the first minute of life, and to perform statistical comparisons on the results obtained in normal births with women in the horizontal and in the vertical positions. To measure the blood loss we evaluated the maternal hematimetric indices before and after birth. In this summary are presented only the results regarding the dependent variables.

Methods

The variables named **independent** are the ones in which it was not possible to identify a direct action on the mother-child dyad; however, because they intensely ease the birth mechanisms, they manage, in a synergistic way (with the other variables) to improve the final results of birth related to the maternal position in this moment. The independent variables identified were:

1- **Role of gravity:** the birthing woman receives its natural help in the process of fetal delivery, quantified as 30 to 40 mmHG of intrauterine extra pressure¹³ and, inversely, she has to increase in 35% the force used in birthing when she pushes in the horizontal position, as consequence of lack of gravity.

2- **Compression of the maternal vasa:** the horizontal position favors this compression, often provoking fetal distress, for the provision of oxygen to the placenta is reduced – and this does not happen if the woman is in the vertical position^{14,15}. The acid-basic balance of the newborn does not modify itself with longer second periods (more than 100 minutes) in squatting births¹⁶. Inversely, if the woman

is supine during the second period, after 30 minutes there is a significant decline¹⁷.

3- **Diameters of the channel of childbirth:** if the woman birthes in the squatting position, some forces are produced that increase the diameters of the pelvis: 1 cm for the transversal diameter and 2 cm for the anterior-posterior one¹⁸, resulting in 28% more room for the fetal passage in the birth channel¹⁹. These papers were questioned by Gupta et al²⁰.

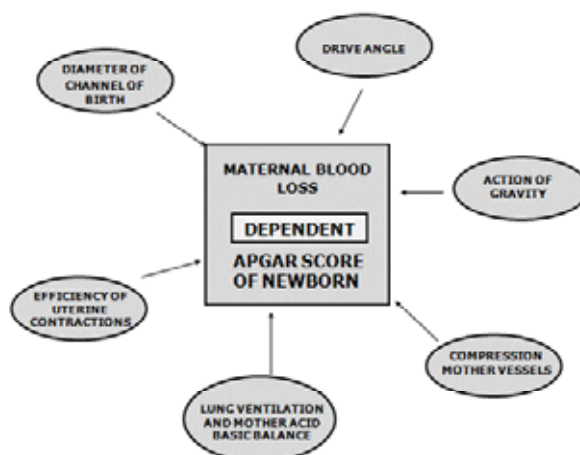
4- **Angle of fit of the presentation:** this, called “drive angle”, is more favorable for the fetus when the mother is in the squatting position^{21,22}.

5- **Lung ventilation and maternal acid-base balance:** This variable is significantly impaired when the woman is in the horizontal position during birth^{23,24}; and

6- **Efficiency of the uterine contractions (during labor and during the second stage).** Uterine contractions are more efficient when the woman adopts the vertical position because in this position the blood circulation is respected, allowing the delivery of the fetus^{25,26}.

For this study, we considered Dependent Variables those in which we could identify a direct action on the mother or on the newborn (Figure 2): loss of blood during birth and Apgar at the first minute.

Figure 2. Independent and dependent variables active in the mechanism of birth.



We analyzed the health status of the mother by quantifying the loss of blood of 65 parturients who delivered in both positions in the Maternity of the Center of Integral Care for Woman's Health (Caism) of Unicamp (Campinas State University). To measure the blood loss we studied 25 women that delivered in the squatting position, 25 in the lithotomic (supine) position and 15 in the squatting-supine (just after delivering in the squatting position, the woman is invited to lie down). Comparison of the Apgar score was made from the information on about 37 thousand deliveries from the database of our institution. In this population we identified 8,810 births in the horizontal (supine) position and 581 in the vertical (squatting) one.

The data obtained were submitted to an analysis of summary statistics, such as measures of central tendency and its respective deviations for quantitative variables. For other variables, appropriate resources of descriptive statistics were used, as tables and graphs. In this phase of the analysis, we didn't intend to test hypotheses. However, it was important to summarize the obtained data, become familiar with them, allowing a better vision of the explored phenomenon, and also for a better understanding of the obtained results. In the present summary we will present only the results of the dependent variables.

Results

Tables 1 and 2 show the results referring to blood loss.

Both tables show that when the parturient is assisted in the squatting position, with the woman's persisting in that position after birth, the loss of blood is significantly larger. When the position is modified immediately after birth, with the woman lying down, here called the squatting-supine position, the blood loss is significantly reduced, especially when compared to the squatting position.

Table 1. Differences in the means of hemoglobine and hematocrit before and after birth for the groups of squatting, supine and squatting-supine positions. Maternity of the Center of Integral Care for Women's Health of Unicamp.

Position in birth	Diference in hemoglobine		Diference no hematocrit	
	gr/100ml (SD)	P value	% (SD)	P value
Squatting	3,3 (1,53)		9,2 (3,84)	
Supine	1,5 (0,41)	<0,001	4,4 (1,5)	<0,001
Squatting-supine	1,0 (0,80)	<0,02	2,5 (2,74)	ns

Table 2. Differences in the means of hemoglobine and hematocrit before and after birth **between** the squatting, the supine and the squatting-supine groups. Maternity of the Center of Integral Care for Women's Health of Unicamp.

Position in birth	Diference in hemoglobine		Diference in hematocrit	
	%	P value	%	P value
Squatting – Supine	1,8	<0,001	4,8	<0,001
Squatting – Squatting-supine	2,3	<0,001	6,7	<0,001
Supine - Squatting-supine	0,5	<0,02	1,9	<0,01

The comparison of fetal results shown in Table 3 also favors the squatting position. The incidence of depressed Apgar score was significantly larger in the cases of normal births with the woman in horizontal position, when compared to the cases with the woman in the squatting position. This difference in the distribution of the cumulative frequency was statistically significant when compared by the test of Kolmogorov-Smirnov ($D=16,2$) with $p<0,0001$, when adopting as cutpoint

Apgar = 8. When we look at Apgar 10, the results are majorly favorable to the squatting position. These results of less blood loss and better vitality of the newborn are a result of the positive influence of the independent variables and are compatible with the data found in the literature about the squatting position.

Table 3. Proportion of newborns by Apgar index in the first minute, according to the position of birth, squatting or supine. Maternity of the Center of Integral Care for Women's Health of Unicamp.

Position in birth	1' Apgar Index			
	0 - 3	4 - 6	0 - 6	10
Squatting group	0,2 %	1,2 %	1,5 %	9,8 %
Supine group	1,5 %.	3,8 %.	5,3 %	2,8 %

Recommendations

This critical analysis of the results for the health of the newly born by normal birth, taking into account it is a low risk population, demonstrates that it should be of great concern of the ones responsible for formulating policies and care guidelines for normal birth, with emphasis on the woman's position, avoiding that she adopts the horizontal position (lithotomic), both for the blood loss and the newborn vitality.

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