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Diana Filipa da Costa Marques

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Intimate Partner Violence During Pregnancy

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Professora Doutora Teresa Magalhães

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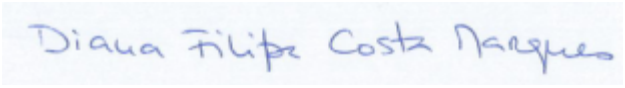

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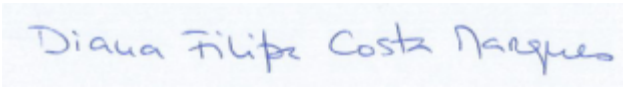

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INTIMATE PARTNER VIOLENCE DURING PREGNANCY

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ABSTRACT

Introduction: Intimate partner violence is an important worldwide problem. During pregnancy this phenomenon can start or exacerbate with serious implications for the pregnancy outcome. This type of violence can also have serious consequences in the physical and mental health of both, mother and child. The aim of this study is to characterize women who are victims of intimate partner violence during pregnancy to contribute to promote the development of early intervention strategies as soon as the risk factors are recognized.

Material and methods: This study is a retrospective analysis of selected medico-legal reports of victims of intimate partner violence, submitted for forensic assessment at the north services of the National Institute of Legal Medicine of Portugal, during the period between 2005 and 2010. It includes two groups with 49 cases each: one group with women who were pregnant at the moment of the abuse and another group with non pregnant women (control).

Results: Over this period, 11263 suspected female victims of intimate partner violence were examined; 0.44% (n=49) of them were pregnant. In the pregnant group most women were single (67.3%), while in the non pregnant group most were married (51%) at the time of the abuse; statistical significant differences have been found (p=0.025). Regarding the professional status, the majority of victims of the pregnant group were unemployed (38.8%). With respect to the number of children, significant statistical differences were found between the two groups (p=0.003). In the pregnant group it was found that a larger number of women had no previous children. The pregnant group also showed a higher number of women with only one previous pregnancy (p=0.022). The non pregnant group showed significant differences for the duration of abuse: “less than one year” when compared with “more than one year”

(p=0.02). The majority of the victims reported multiple mechanisms of abuse. They were mainly punching, pushing, slapping and kicking (49%, 40.8%, 36.7% and 34.7%, respectively) in the pregnant group case. For the non pregnant group, the same mechanisms were the most frequents (53.1%, 32.7%, 26.5% and 28.6%, respectively). Both in the pregnant group and in non pregnant group face and limbs are the anatomical areas more frequently injured, with no significantly statistical differences, but in pregnant group there is description of injuries at the torso in 14.3% of the cases, while in non pregnant group only the thorax has been involved. No significant statistical differences were found between both groups with regard to demands for medical care after abuse (p=0.539).

Conclusions: Intimate partner violence in pregnancy is probably underreported. Women victims of intimate partner violence during pregnancy are mostly unmarried compared with non pregnant and there seems to be a predominance of abuse in women who are pregnant for the first time. Further studies are necessary to better characterize the medico-legal aspects in this kind of situations.

KEYWORDS: Intimate partner violence; female victims; pregnancy; Portugal

INTRODUCTION

Violence, which includes abuse, is a very serious and complex social issue, with harmful physical and psychological consequences for victims. Besides, it also has important implications for their families and society in general.[1]

According to the World Health Organization (WHO), the most common form of abuse suffered by women is perpetrated by an intimate partner.[2, 3] This intimate partner violence (IPV) is defined as actual or threatened physical, sexual, psychological, and emotional abuse by a current or former intimate partner, regardless of the involved genders and cohabitation.[4] Consequences are always very severe in terms of psychological and physical health and in socioeconomic aspects; furthermore, each year, at least 1400 women die in the United States of America as a result of IPV.[3]

Pregnancy is a high-risk period during which violence can start or exacerbate,[3, 4, 5, 6, 7, 8, 9] usually resulting on adverse outcomes for the newborn.[3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17] According to a study developed at the Obstetrics Department of São João Hospital, in Porto, preterm delivery was significantly more frequent among physically abused than non-abused pregnant women (21.4% vs 6.8%; $p<0.0001$).[10] Studies show that the prevalence of violence from a man to a woman in an intimate relationship at any time ranges from 9.7% to 29.7%,[5] and the overall prevalence of IPV during pregnancy varies between 0.9% and 20.1%.[5, 9, 11, 12, 18, 19, 20, 21] In Portugal the estimated value is around 10%.[10]

Violence during pregnancy deserves special attention because it affects women at a moment of great vulnerability. Moreover, it may potentiate an increase in morbidity and mortality of the mother as well as the newborn. This violence may influence the evolution of the perinatal period by the interference of two mechanisms: (a) the first is the trauma itself, capable of promoting lesions that affect women during pregnancy; (b) the second is based on the theory of continuous stress.[2, 10, 18] This kind of abuse may have serious consequences for the women's physical and mental health.[11] Direct health effects include the increase likelihood of miscarriage, premature labour or delivery, low birth weight as well as higher levels of depression. An indirect health effect described in several studies is substance abuse by women who suffer violence in order to diminish feelings of shame and humiliation.[3, 5, 13]

Hedin et al. found that physical abuse during pregnancy occurred mostly in cases were it was already happening during the period of time preceding the pregnancy, suggesting that it is important to consider previous history of abuse.[5]

Some risk factors have been associated with IPV during pregnancy.[4, 6, 8, 9, 11, 12, 13, 18, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30] Risk factors refer to aspects that increase the probability of occurrence or maintenance of abuse. They may be related to the individual characteristics of the victim or the abuser, their family background and socio-cultural environment. The presence of a risk factor does not mean, by itself, the presence of abuse. It is known, however, that the combination of several risk factors could significantly increase the likelihood of abuse.[1] Risk factors for violence during pregnancy include: socioeconomic status,[11, 22, 25] a young age,[5, 6, 8, 9, 11, 12, 15, 18, 22, 23, 25, 27, 29, 30] ethnicity,[11, 12, 18, 22] marital status (single),[5, 12, 17, 18, 22, 25, 28] low level of education,[4, 6, 12, 18, 22, 25] unemployment,[18] parity,[6,18] absence of prenatal care,[18, 25] low level of social support,[11, 25, 26] unintended pregnancy,[9, 30] smoking, alcohol and drug abuse by women partners.[3, 4, 5, 11, 12, 13, 15, 17, 31] Another factor often associated with increased risk for IPV is witnessing or being a victim of violence during childhood.[11, 12, 17]

OBJECTIVES

The general objective of this study was to characterize women who are victims of IPV during pregnancy to contribute to promote the development of early intervention strategies as soon as the risk factors are recognized. The specifics objectives were to characterize household's situation, including victims, alleged perpetrators and couple's situation, as well as physical abuse and legal outcomes of the cases.

MATERIALS AND METHODS

The present study is a retrospective review of selected medico-legal reports of victims of IPV, submitted for forensic assessment at the north services of the National Institute of Legal Medicine of Portugal (INML), during the period between 2005 and 2010. It includes two groups.

For the group of pregnant women (n=49), the inclusion criteria were:

a) Women in reproductive age (15-49 years old);
b) Presenting a claim of IPV;
c) Perpetrated during the pregnancy;
d) Observed at the north services of the INML;
e) Between 2005 and 2010.

For control, a group of non pregnant women was randomly selected (n=49); the inclusion criteria were:

a) Women in reproductive age (15-49 years old);
b) Presenting a claim of IPV;
c) Not pregnant at the time of the alleged abuse;
d) Observed at the north services of the INML;
e) Between 2005 and 2010.

For data collection, a form, previously developed for collecting data from abused women, was adapted and applied to medico-legal reports of selected women. Variables studied included the characterization of the: (a) household at the moment of the forensic assessment (victim, alleged abuser, couple relationship and previous pregnancies); (b) current episode of violence; (c) physical abuse that led to medico-legal observation; (d) legal outcomes.

In order to evaluate the judicial outcome for the pregnant group, judicial decisions were requested by mail to the respective the Public Prosecutor Offices and Courts; only in 19 cases the information was sent to us.

Statistical analysis was performed using SPSS (Statistical Package for Social Sciences), version 17.0; including descriptive statistics and correlation tests using Pearson's Chi-square, due to sample sizes. The significance level considered was $p<0.05$.

RESULTS

Characterization of the victims

The victims' characterization is summarized in Table 1.

In the pregnant group (PG) most women were single (67.3%), while in the non pregnant group (NPG) most were married (51%) at the time of the abuse; statistical significant differences have been found (p=0.025).

Data on the educational level were available in only 8 cases in the PG, and of these, 2 had completed higher education. In the NPG data was available only in 5 cases and de maximum level of education was the 10^{th}-12^{th} grade (n=2).

Regarding the professional status, the majority of victims of the PG were unemployed (38.8%) at the time of the forensic evaluation unlike that of the NPG in which most of the women played active roles in protection, security or personal services (36.7%). No statistical differences were detected between both groups, regarding the level of unemployment (p=0.355).

Just in one case, in both groups, there was data related to a previous history of psychiatric illness.

Concerning the history of abuse during childhood/youth, there was no information in 44 and in 46 reports related, respectively, to PG and NPG, and because of that obtained data is insusceptible of further analysis.

Characterization of the alleged perpetrators

All alleged abusers were men. In the PG their ages were known in 40.8% (n=20) and ranged from 19 to 54 years old (mean=30.55; SD=2.029), and in the NPG their ages were known in only 24.5% (n=12), ranging between 21 and 46 years old (mean=28.92; SD=2.476).

In the PG only 9 cases (18.4%) had information about the education level of the individuals. One element held less than primary school education as well as only one had completed university. In the NPG this information was present only in 6 cases (12.2%) and similarly one had less than primary school education and one had completed higher university.

There was no predominance of a particular professional activity regarding the cases where this information was obtained: 42.9% (n=21) in the PG and only 10.2% (n=13) in the NPG.

For the PG we collected information about substance abuse of the alleged perpetrators in 40.8% (n=20) of the cases; of these, 35% (n=7) had no consumption habits, 25% (n=5) had alcohol consumption, 25% (n=5) drug abuse, and 15% (n=3) consumption of both alcohol and drugs. In the NPG this data was found in 30.6% (n=15) of the cases; of these, 13.3% (n=2) had no consumption habits, 33.3% (n=5) had alcohol consumption, 20% (n=3) drug abuse and 33.3% (n=5) consumption of both alcohol and drugs.

Three of the men (6.1%) of the PG had history of deviant behaviour, including theft/robbery (n=1; 2%) and physical offenses (n=2; 4.1%); however, this information was unavailable in 87.8% (n=43) of the cases. In the NPG, one man (2%) had deviant behavior, namely theft/robbery and this information was also unavailable in 93.9% (n=46) of the cases.

Characterization of the couple's situation

No statistical differences were detected between PG and NPG, regarding the situation of the couple at the time of the assault (living together or not) (p=0.110).

For the PG, in 26.5% (n=13) of the cases we had no information about the number of children of the victim. Of the remaining, 14 (38.9%) had at least one child (ages varying between 0 and 12 years of age) from the alleged abuser and 6 (16.7%) had one or more children from another relationship.

Regarding the NPG, also in 26.5% (n=13) we had no information about the number of children of the victim. Of the remaining, 24 (75%) had at least one child in common with the alleged abuser (ages varying between 0 and 16 years of age); in 12.5% (n=4) she had one or more children as a result of another relationship.

With respect to the number of children, significant statistical differences were found between the two groups (p=0.003). In the PG it was found that a larger number of women had no previous children.

Regarding the PG, in 32.7% (n=16) of the cases it was not possible to obtain information about the number of previous pregnancies. In 34.7% (n=17) this was the first pregnancy, in 20.4% (n=10) it was the second and in 12.2% (n=6) was at least the

third time they were pregnant. In the NPG in 49% (n=24) of the cases was not possible to obtain information about the number of previous pregnancies. In contrast, there was a history of one previous pregnancy in 36.7% (n=18), 6.1% (n=3) had already been pregnant twice and 8.1% (n=4) had been pregnant three times or more. It was found significant statistical differences with respect to the number of previous pregnancies, in which the PG showed a higher number of women with only one previous pregnancy (p=0.022).

Characterization of previous violence

In the PG at least 69.4% (n=34) of the women had already suffered physical abuse, psychological or both, perpetrated by the alleged abuser. Of these, 27.8% (n=10) were initiated during courtship, 8.3% (n=3) during pregnancy, and the others during the remaining period of cohabitation, except in one case in which the abuse has started after marital separation.

In the NPG, at least 77.6% (n=38) of the women had already suffered physical abuse, psychological, or both, perpetrated by the alleged abuser. Of these, 23.7% (n=9) began during courtship, 39.5% (n=15) during the cohabitation period and only in one case (2.6%) it started during the pregnancy. No significant statistical differences were found regarding the beginning of violence: during courtship or during cohabitation (p=0.858).

In the PG 3 women (6.1%) were also assaulted during a previous pregnancy, although in 59.2% (n=29) it was not possible to assess this sort of data. In the NPG 6 women (12.2%) had been abused during pregnancy but in 79.6% (n=39) there was no available information.

With respect to the duration of the abuse, in the PG 17 women (34.7%) were victims of abuse for less than one year, 12 (24.5%) for one or more but less than six years, 1 (2.0%) for six or more but less than eleven years and in 19 cases (38.8%) this information was not accessed. About NPG, 6 women (12.2%) suffered abuse for less than one year, 11 (22.4%) for one or more but less than six years, 1 (2.0%) for six or more but less than eleven, 3 (6.1%) with history of abuse for between eleven and fifteen years, 2 (4.1%) for between sixteen and twenty years and in 26 (53.1%) cases this data was unavailable. The NPG showed significant differences for the duration of abuse: “less than one year” when compared with “more than one year” (p=0.02).

Characterization of the current episode of violence

Regarding the PG, at the time of the assault, 93.9% (n=46) of the women were between the 4th and 38th weeks of gestation; however, in 6.1% of the cases it was not possible to collect this data.

The majority of the victims reported multiple mechanisms of abuse. They were mainly punching, pushing, slapping and kicking (49%, 40.8%, 36.7% and 34.7%, respectively) in PG case (Table 2). For NPG, the same mechanisms were the most frequents (53.1%, 32.7%, 26.5% and 28.6%, respectively) (Table 2).

Both in PG and in NPG face and limbs are the anatomical areas more frequently injured (Table 3), with no significantly statistical differences, but in PG there is description of injuries at the torso in 14.3% of the cases, while in NPG only the thorax has been involved.

In PG the number the days of illness was 0-8 days and in the NPG of 0-8 days in 45 cases and of 9-15days in the remained.

No significant statistical differences were found between both groups with regard to demands for medical care (p=0.539); 30 women (61.2%) in the PG and 27 (55.1%) in the NPG had resort to health services after abuse.

In 20.4% (n=10) of the cases of the PG the abuse was witnessed (9 by a child under the age of 18 years of age and 1 by an acquaintance). In the NPG in 18.4% (n=9) of the cases a child under the age of 18 years witnessed the assault.

Legal outcomes

In order to determine the judicial outcomes of the cases in the PG, the respective judicial decisions were requested. Of the 49 sample cases, we obtained response in 19 (38.8%). Of these, in 12 cases (63.2%) the charges were dismissed, 2 alleged abusers (10.5%) were acquitted at trial and 4 (21.1%) were convicted, but none with effective imprisonment time. In 1 case (5.3%) the alleged abuser was still awaiting for judgment.

DISCUSSION

Intimate partner violence is the most common form of violence against women worldwide,[2, 27] constituting a serious public health problem.[17, 29, 30, 32] This kind of abuse among pregnant women has been reported in most parts of the world. Although its prevalence rates vary among studies, possibly due to different definitions of violence, methodologies and sampling strategies,[9, 15, 33] some studies indicate that violence during pregnancy is a common experience and a major concern.[27]

Between 2005 and 2010, pregnant victims of IPV accounted for 0.44% of all victims of this type of violence examined at the clinical forensic medicine departments of the north services of the INML. This number does not represent the true magnitude of the problem since it is known that the majority of the situations are concealed by the victim and the health care professionals also do not report all cases that they have knowledge.

During pregnancy IPV may begin or escalate in severity.[3, 4, 5, 6, 7, 8, 9] The abuse suffered by these women during pregnancy may be a reflection of intimate violence in general, but it can also result of problems involving the pregnancy itself.[31] Despite its prevalence during this period of women's life not being known exactly, it is known that it happens more frequently than many other conditions that are routinely screened for during pregnancy.[3, 27] This type of violence results in a variety of complications and increases the risk of an adverse outcome.[3, 4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17]

One factor sequentially associated with an increased risk for IPV is that women who had witnessed or had been themselves victims of violence in childhood.[11, 12, 17] In our sample we only had information that one woman from each group had been abused as a child, but we can not forget that this is a retrospective study in which a considerably amount of data is missing, and so because of that this information should not be valued.

With the present study we aimed to compare some variables that we thought might be increased in the pregnant group.

With respect to the number of children, we found that the PG had a greater number of women without any children. This led us to wonder if the primiparous are at greater risk of being abused by their intimate partners. It is known that the transition to

parenthood brings new challenges to the couple's relationship, and cumulative stressors during this time may increase the likelihood of IPV.[28]

Regarding the process of seeking medical help after abuse, which could be more frequent in pregnant women because of their condition and their concern about the baby, this study found no statistical significant differences in this issue. This may be due to the small sample size and the large amount of missing data that may somewhat mask this information. But it also can be related with the great tendency of no disclose the abuse because of shame and fear. In fact a large number of women who are victims of abuse by their partners refer that the abuse that they suffered was "not so bad" as abuse experienced by other women. This tendency to minimize the impact of IPV is alarming since it may discourage these women to seek help.[14]

A particularly disturbing form of violence against pregnant women is when the target of the injuries is the abdomen, which frequently occurs; thereby this not only affects women's health but also potentially endangers pregnancy.[34] We thought that perhaps there might be differences in the anatomic area harmed preferably, in particular, if there is a certain predominance for lesions in the abdomen of pregnant women; however, lesions in the abdomen were only recorded in 2 cases, a number which impaired further statistical analysis. In the future, it would be interesting to conduct a study to better characterize the preferentially affected body area, so as to perceive if the perpetrators are intending to affect the developing fetus or only the woman.

Although we have not focused on psychological aggression in our study, this also might be damaging to the women, possibly even more than physical violence. Psychological abuse almost always precedes physical abuse.[35] This kind of violence has been associated with adverse mental health outcomes including depressive symptomatology,[4, 6, 8, 10, 14, 15, 16, 17, 25, 27, 30, 35] post-traumatic stress disorder, anxiety, phobias, suicidal intent,[16] and alcohol and drugs abuse.[3, 4, 5, 11, 12, 13, 15, 17, 31] All these aspects are also harmful for the developing baby since a depressed woman may neglect their pregnancy. The stress from current or past abuse can impair fetal growth and development.[34] Furthermore women who suffered psychological abuse during pregnancy have higher levels of depression symptoms after delivery.[35] Therefore the presence of depression is an important risk indicator for IPV and any woman with suspected depression should be asked about possible IPV.[30]

This study had some limitations that deserve mention. First, as we only included in the PG women who were actually pregnant at the time of the forensic examination,

the resulting small size of the sample might impair the results. We acknowledge that prevalence obtained by us is thus probably much lower than real, since many women victims of abuse were not questioned about the presence or absence of episodes of aggression during pregnancy and some, even having been asked about this had denied by shame or embarrassment about the subject.

Another limitation has to do with the fact that this is a retrospective study based on the analysis of medico-legal reports that have not been performed in order to participate in this kind of study, therefore do not include all items that we tried to analyze.

In Portugal, it was already conducted a study with the aim of understanding the relationship between IPV during pregnancy and preterm birth. They have concluded that women abused during pregnancy had an increased risk of preterm birth regardless of presence of another factors related to the higher incidence of preterm delivery.[10] However there is still a gap with respect to the forensic characterization of this phenomenon. Therefore, it would be interesting to conduct a longitudinal study in order to better characterize the medico-legal aspects of cases of IPV during pregnancy.

The health sector has an important role in combating this type of violence by means of research, case notifications, organization of reference services for victims as well as other proposals involving intervention.[11] In fact, studies show that women abused during pregnancy frequently continue to suffer abuse after child birth, so both the safety of the mother and child are at risk.[36] The emotional consequences for children who witness violence between their parents can be even worse than when they become targets themselves.[25, 35] Therefore it would be important to implement standardized screening measures to be applied at the primary health care centre in order to timely detect cases of violence during pregnancy, making it safer for the women and their baby. The *American Medical Association* recommends that health care providers routinely ask patients about IPV[37] and in fact, most women agree to IPV screening.[26]

CONCLUSIONS

This study allows us to conclude that:

a) IPV in pregnancy is probably underreported by the victims and the health care professionals, taking into account the low prevalence of women who were undergoing forensic evaluation during the study period when compared to the values found in international studies;
b) Women victims of IPV during pregnancy are mostly unmarried compared with non pregnant;
c) There seems to be a predominance of abuse in women who are pregnant for the first time when compared with those who already have children;
d) The majority of women, pregnant and non pregnant, seek for medical help after abuse;
e) Most of the victims is achieved by multiple mechanisms of aggression whereas punching, pushing, slapping and kicking are revealed the most commons regardless the women are pregnant or not;
f) The affected body areas are mostly the face and upper limbs in both pregnant and non pregnant women.

Further studies are necessary to better characterize the medico-legal aspects in this kind of situations. It is important to evaluate these cases in terms of sequelae (temporary and permanent) as well as in terms of life-threatening. Another important forensic aspect that needs to be better known is if there is a preference for abdominal attaining which in this study could not be statistically analyzed due to missing data.

ETHICAL APPROVAL

Despite we do not require the approval from the Ethics Committee, since it is a retrospective study in which the identity of women involved was preserved, the development of the study was conducted according to high ethical standards.

REFERENCES

1. L. Magalhães T. Violência e Abuso Respostas Simples para Questões Complexas. Imprensa da Universidade de Coimbra; 2010.
2. Lourenço MA, Deslandes SF. Experiência do cuidado materno e amamentação sob a ótica de mulheres vítimas de violência conjugal. Rev Saúde Pública 2008; 42(4): 615-21.
3. Linda R. Intimate Partner Violence and its Implication for Pregnancy. Clinical Obstetrics and Gynecology 2008; volume 51, number 2, 385-397.
4. Ntaganira J, Muula AS, Masaisa F, Dusabeyezu F, Siziya S, Rudatsikira E. Intimate partner violence among pregnant women in Rwanda. BMC Women's Health 2008, 8: 17.
5. Hedin LW, Janson PO. Domestic violence during pregnancy, The prevalence of physical injuries, substance use, abortions and miscarriages. Acta Obst Gynecol Scand 2000; 79: 625-630.
6. Taft AJ, Small R, Hegarty KL, Lumley J, Watson LF, Gold L. MOSAIC (MotherS' Advocates In the Community): protocol and sample description of a cluster randomized trial of mentor mother support to reduce intimate partner violence among pregnant or recent mothers. BMC Public Health 2009, 9: 159.
7. Kothari CL, Cerulli C, Steven M, Rhodes KV. Perinatal Status and Help-Seeking for Intimate Partner Violence. Journal of Women's Health, vol 18, No.10, 2009, 1639-46.
8. Lindhorst T, Oxford M. The long-term effects of intimate partner violence on adolescent mothers' depressive symptoms. Soc Sci Med. 2008 March; 66(6): 1322-1333.
9. Jahanfar S, Kamarudin EB, Sarpin MAB et al. The Prevalence of Domestic Violence Against Pregnant Women in Perak, Malaysia. Arch Iranian Med 2007; 10(3): 376-378.
10. Rodrigues T, Rocha L, Barros H. Physical abuse during pregnancy and preterm delivery. Am J Obstet Gynecol 2008; 198: 171.e1-171.e6.
11. Audi CAF, Segall-Corrêa AM, Santiago SM, Andrade MG, Pérez-Escamilla R. Violence against pregnant women: prevalence and associated factors. Rev Saúde Pública 2008; 42(5).

12. Shamu S, Abrahams N, Temmerman M, Musekiwa A, Zarowsky C. A Systematic Review of African Studies on Intimate Partner Violence against Pregnant Women: Prevalence and Risk Factors. Plos One, March 2011, vol 6, issue 3, e17591.
13. Kiely M, El-Mohandes AAE, El-Khorazaty MN, Gantz MG. An integrated intervention to reduce intimate partner violence in pregnancy: a randomized trial. Obstet Gynecol, 2010 February; 115(2Pt1): 273-283.
14. Rose L, Alhusen J, Bhandari S, Soeken K, Marcantonio K, Bullock L, Sharps P. Impact of Intimate Partner Violence on Pregnant Women's Mental Health: Mental Distress and Mental Strengh. Issues Ment Health Nurs. 2010 February; 31 (2): 103-111.
15. Varma D, Phil M, Claudia PS, Thomas T, Carey MP. Intimate Partner Violence and Sexual Coercion among Pregnant Women in India: Relationship with Depression and Post-traumatic Stress Disorder. J Affect Disord 2007 September; 102 (1-3): 227-235.
16. Ellsberg M, Jansen HAFMT, Heise L, Watts CH, García-Moreno C. Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study. Lancet 2008; 371: 1165-72.
17. Cuevas S, Blanco J, Juárez C, Palma O, Valdez-Santiago R. Violencia y embarazo en usuárias del sector salude n estados de alta marginación en México. Salud Pública de México, 2006; 48(2): 239-249.
18. Coker AL, Sanderson M, Dong B. Partner violence during pregnancy and risk of adverse pregnancy outcomes. Paediatric and Perinatal Epidemiology 2004, 18, 260-269.
19. Jasinski JL. Pregnancy and Domestic Violence: A Review of the Literature. Trauma, Violence and Abuse, 2004; 5(1): 47-64.
20. Abbasi K. Obstetricians must ask about domestic violence. BMJ 1998; 316:9.
21. TJ, Salzman LE, Gazmararian JA, Spitz AM, Lazorick S, Marks JS. Violence during pregnancy: measurement issues. Am J Public Health 1998; 88: 274-6.
22. Bailey BA. Partner violence during pregnancy: prevalence, effects, screening, and management. International Journal of Women's Health 2010: 2 183-197.

23. Miller E, Decker Mr, McCanley HL, Tancredi DJ, Levenson RR, Waldman J, Schoenwal P, Silverman JG. Pregnancy coercion, intimate partner violence, and unintended pregnancy. Contraception, 2010 April; 81(4): 316-322.
24. Flury M, Nyberg E, Riecher-Rössler A. Domestic violence against women: definitions, epidemiology, risk factors and consequences. Swiss Med Wkly, 2010; 140: w13099.
25. Moraes CL, Reichenheim ME. Domestic Violence during Pregnancy in Rio de Janeiro, Brazil. International Journal of Gynecology and Obstetrics 79 (2002), 269-277.
26. Salazar M, Valladares E, Öhman A, Högberg U. Ending Intimate Partner Violence after Pregnancy: Findings from a Community-based Longitudinal Study in Nicaragua. BMC Public Health 2009, 9: 350.
27. Devries KM, Kishor S, Johnson H, Stöck LH, Bacchus LJ, Garcia-Moreno C, Watts C. Intimate partner violence during pregnancy: analysis of prevalence data from 19 countries. Reproductive Health Matters 2010; 18(36): 158-170.
28. Kan ML, Feinberg ME. Measurement and Correlates of Intimate Partner Violence Among Expectant First-Time Parents. Violence Vict 2010; 25(3): 319-331.
29. Harry Kissoon SD, Rickert VI, Wiemann CM. Prevalence and Patterns of Intimate Partner Violence Among Adolescent Mothers During the Postpartum Period. Arch Pediatr Adolesc Med 2002; 156: 325-330.
30. Wathen et al. Risk indicators to identify intimate partner violence in the emergency department. Open Medicine 2007 1(2): E113-E122.
31. Nasir K, Hyder AA. Violence against pregnant women in developing countries. European Journal of Public Health 2003; 13: 105-107.
32. Jayatilleke AC, Poudel KC, Yasuoka J, Jayatilleke AU, Jimba M. Intimate Partner Violence in Sri Lanka. Bio Science Trends 2010; 4(3): 90-95.
33. Peedicayil A, Sadowski LS, Jeyaseelan L, Shankar V, Jain D, Suresh S, Bangdiwala SI. Spousal physical violence against women during pregnancy. BJOG 2004; 3:682–687.
34. Information sheet. Intimate partner violence during pregnancy. World Health Organization 2011.

35. Tiwari et al. The impact of psychological abuse by an intimate partner on the mental health of pregnant women. BJOG An International Journal of Obstetrics and Gynaecology 2008: 377-384.
36. Martin SL, Mackie L, Kupper LL, Bruscher PA, Moracco KE. Physical Abuse of Women Before, During, and After Pregnancy. JAMA, March 28, 2001 – vol 285, No.12, 1581-84.
37. Bott S, Morrison A, Ellsberg M: Preventing and responding to gender-based violence in middle and low income countries: a global review and analysis. In World Bank Policy Research Working Paper 3618 Washington, DC: World Bank; 2005.

TABLES

Table 1: Characterization of the victims

	PG (n=49)		NPG (n=49)		p
	n	%	n	%	
Resident type					
National	46	93.9	46	93.9	
Immigrant	3	6.1	3	6.1	
Marital status					
Single	33	67.3	22	44.9	0.025
Other condition	16	32.6	27	55.1	
Married	8	16.3	25	51.0	
Divorced	7	14.3	2	4.1	
Widow	1	2.0	0	0	
Education level					
1st to 4th grade	0	0	1	2.0	
5th to 6th grade	1	2.0	0	0	
7th to 9th grade	3	6.1	2	4.1	
10th to 12th grade	2	4.1	2	4.1	
University	2	4.1	0	0	
No information	41	83.7	44	89.8	
Profession					
Unemployed	19	38.8	15	30.6	0.355
Other condition	29	58.9	34	69.4	
Scientific occupation, technical, artistic or similar	3	6.1	1	2.0	
Director or senior	0	0	1	2.0	
Admnistrative or similar	1	2.0	0	0	
Industry worker	1	2.0	2	4.1	
Protection services, security, personal, domestic services or similar	11	22.4	18	36.7	
Trade and sellers	6	12.2	4	8.2	
“Housewife”	3	6.1	3	6.1	
Student	3	6.1	2	4.1	
Other	1	2.0	3	6.1	
No information	1	2.0	0	0	
Psychiatric history					
Yes	2	4.1	1	2.0	
No	4	8.2	0	0	
No information	43	87.8	48	98.0	
History of childhood abuse					
Yes	1	2.0	1	2.0	
No	4	8.2	2	4.1	
No information	44	89.8	46	93.9	

Table 2: Mechanisms of the current physical abuse

Mechanism	PG (n=49)		NPG (n=49)	
	n	%	n	%
Pushing	20	40.8	16	32.7
Pressing	8	16.3	12	24.5
Pinching	1	2.0	0	0
Scratching	1	2.0	1	2.0
Pulling hair	7	14.3	10	20.4
Slapping	18	36.7	13	26.5
Punching	24	49.0	26	53.1
Kicking	17	34.7	14	28.6
Biting	1	2.0	3	6.1
Strangling	5	10.2	5	10.2
Blunt instrument	3	6.1	4	8.2
Sharp instrument	1	2.0	1	2.0
Mixed instrument	0	0	1	2.0
Others	9	18.4	7	14.3

Table 3: Anatomical distribution of the injuries

Anatomical distribution	PG (n=49)		NPG (n=49)	
	n	%	n	%
Cranium	4	8.2	8	16.3
Face	12	24.5	15	30.6
Neck	2	4.1	1	2.0
Rachis	1	2.0	0	0
Thorax	5	10.2	5	10.2
Abdomen	2	4.1	0	0
Perineum	0	0	0	0
Right Upper Limb	11	22.4	14	28.6
Left Upper Limb	12	24.5	17	34.7
Right Lower Limb	8	16.3	9	18.4
Left Lower Limb	8	16.3	9	18.4

ANEXOS

Anexo 1: Regras de publicação

(Revista de referência: ***Journal of Forensic and Legal Medicine***)

INTRODUCTION

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Short Report: new research or clinical issue, straightforward idea, simple methodology, concise take home message.

Case Reviews: one or two related cases with specific message, backed up by broad review of related literature.

Learning Point: single case where outcome identifies or reinforces an important clinical, pathological or legal issue.

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