Maternal-Fetal Monitoring during Dental Procedure in Patients with Heart Valve Disease

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Summary

Background: The effects of local dental anesthesia with lidocaine and epinephrine on cardiovascular parameters of pregnant women with heart valve diseases and their fetuses are not fully understood.

Objectives: To assess and analyze cardiotocographic, blood pressure and electrocardiographic parameters of pregnant women with rheumatic heart valve disease undergoing local anesthesia with 1.8mL of lidocaine 2% with or without epinephrine 1:100,000 during restorative dental treatment.

Methods: Maternal ambulatory blood pressure and electrocardiographic monitoring as well as cardiotocography of 31 patients with rheumatic heart disease were performed between the 28th and 37th week of gestation. The patients were divided into two groups, those with or without vasoconstrictor.

Results: A significant reduction in maternal heart rate was shown in both groups during the procedure in comparison with the other periods ($p<0.001$). Cardiac arrhythmia was observed in nine (29.0%) patients, of which seven (41.8%) were from the group of 17 pregnant women who received anesthesia plus epinephrine. No difference in maternal blood pressure was observed when periods or groups were compared ($p>0.05$). The same occurred ($p>0.05$) with the number of uterine contractions, baseline level and variability, and number of accelerations of fetal heart rate.

Conclusion: The use of 1.8mL of lidocaine 2% in combination with epinephrine was safe and efficient in restorative dental procedures during pregnancy in women with rheumatic heart valve disease. (Arq Bras Cardiol 2009; 93(5) : 430-438)

Key Words: Electrocardiography, ambulatory / methods; blood pressure monitoring, ambulatory / methods; cardiotocography / methods; anesthesia, local / methods; pregnant women; rheumatic heart disease.

Introduction

Modifications in the physiology of the woman's body occur during pregnancy, the most significant of which is the increase in cardiac output that starts as from the first trimester of gestation and progresses until labor[1,2]. Inappropriate adaptation to the hemodynamic overload may result in complications during gestation of patients with heart disease, even when the functional capacity is favorable in the beginning of gestation[3].

The incidence of heart disease during pregnancy ranges from 1% to 4%[4], making it the fourth cause of maternal death and the major non-obstetric cause of death[5]. In Brazil, approximately 50% of heart diseases in pregnant women are related to chronic rheumatic disease[4].

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In Dentistry, the choice of the local anesthetics should be based on the efficacy for the mother and absence of risks for the fetus[6]. Thus, lidocaine plus epinephrine is an appropriate combination for local dental anesthesia in pregnant women[7].

Few studies on the effects of local anesthetics used in Dentistry in pregnant women with heart valve diseases are available. The objective of this study was to analyze fetal parameters obtained with cardiotocography (CTG) as well as blood pressure (BP) and electrocardiographic parameters obtained with 24-hour ambulatory monitoring of pregnant women with heart valve disease undergoing local anesthesia with lidocaine 2% with or without epinephrine 1:100,000 during restorative dental procedure.

Materials and methods

Sample selection

From April 2004 to January 2006, 31 pregnant women aged between 18 and 44 years (mean 28 ± 5.7) diagnosed with

List of abbreviations and acronyms

bpm	beats per minute
CTG	cardiotocography
MUC	maternal uterine contraction
SVE	supraventricular extrasystole
VE	ventricular extrasystole
HR	heart rate
FHR	fetal heart rate
LPE	lidocaine 2% plus epinephrine 1:100,000
LWE	lidocaine 2% without epinephrine
ABPM	ambulatory blood pressure monitoring
FBM	fetal body movement
mmHg	millimeters of mercury
NYHA	New York Heart Association
p	significance level
P0	period 0 (zero) - baseline
P0C	period 0 (zero) of CTG - baseline
P0H	period 0 (zero) of Holter monitoring - baseline
P0A	period 0 (zero) of ABPM - baseline
P1	period 1 – dental procedure
P1C	period 1 of CTG – dental procedure
$P1C_1$	20 first minutes of P1C
$P1C_2$	from 21 to 40 minutes of P1C
$P1C_3$	from 41 to 60 minutes of P1C
P1H	period 1 of Holter monitoring – dental procedure
P1A	period 1 of ABPM – dental procedure
P2	period 2 – post-procedure
P24H	24-h Holter monitoring period
P2C	period 2 of CTG – post-procedural period
P2H	period 2 of Holter monitoring – post-procedural period
P2A	period 2 of ABPM – post-procedural period
BP	blood pressure
DBP	diastolic blood pressure
SBP	systolic blood pressure
SPA	sleep period of ABPM
WPA	wake period of ABPM
NST	non-stress test

rheumatic heart valve disease in New York Heart Association (NYHA)[8] functional class I or II (4 in functional class II) were selected in the Heart Disease and Pregnancy and Family Planning Sector of our hospital (Table 1).

Gestational age of the patients at inclusion in the study ranged from 28 to 37 weeks (mean 32.3 ± 2.7) and the body mass index (BMI)[9] ranged from 20.6 to 41.4 (mean 27±4,3). All needed restoration in premolars and/or lower molars.

The exclusion criteria were: twin pregnancy, functional class III-IV heart failure, uncontrolled chronic hypertension, complex and/or symptomatic ventricular arrhythmia, preeclampsia, uterine growth restriction, labor and anxiety disorders.

The study was started after approval by the Institutional Ethics Committee and a written informed consent was obtained from all participants.

Dental procedure and data acquisition

After clinical and radiographic examination and periodontal scaling, in the third session the patients were randomized for the anesthetic solution, and the restorative procedure in the premolar of lower molar was performed. Fourteen (45.2%) patients randomized to receive anesthetic solution of lidocaine 2% without vasoconstrictor comprised the LWE group, and 17 (54.8%) patients randomized for lidocaine 2% plus epinephrine 1:100,000 comprised the LPE group (Table 1).

Modified periodontal ligament injection[10] was performed with the The Wand II (Milestone International) computerized system, with a 27G ½ needle, and 1.8mL (one cartridge) of the randomized anesthetic solution was injected slowly (one drop every two or three seconds).

The digital Holter monitoring recorder (12-lead model 300-6, DMS, Brazil) for electrocardiogram recording and the digital ambulatory blood pressure monitor (ABPM) using the oscilometric method (model TM-2430, A&D) were set up and turned on simultaneously, one to two hours before the procedure. At the beginning of the one-hour rest, the patients received antibiotic prophylaxis for infective endocarditis[11], and during this period, which was considered baseline (P0), Holter monitoring (P0H) and ABPM (P0A) data were collected.

Next, a cardiotocograph (model MT-325, Toitu)* was set up with the patient sitting in the dental chair in the supine position at 45°, and the recordings were started, the 20 first minutes of which were considered baseline CTG (P0C). The period extending from the moment the anesthetic solution started to be administered until the end of the dental procedure was called procedural period (P1). Therefore, we obtained P1H, P1A and P1C relative to Holter monitoring, ABPM and CTG, respectively. P1C, in turn, was subdivided into three 20-minute intervals ($P1C_1$, $P1C_2$, $P1C_3$), which is considered the standard time for the analysis of this test.

The post-procedural period (P2) corresponded to the 20 minutes between the end of the procedure and the moment

* The researcher was technically prepared to perform the cardiotocographic test by attending a course given by the Brazilian Institute of Cardiotocography – IBC – Sao Paulo – SP, Brazil, and received constant guidance from the obstetrician specialized in cardiotocography

Table 1 – Sample distribution according to the type and severity of valvular lesions, age, functional class and study group.

Patient	Valvular dysfunction			Age	Functional class		Study group	
	MiV	AoV	TrV		I	II	LPE	LWE
1	BioP (I mild)	mild R	mild R	26	.			.
2	S+R (moderate S + mild R)	S+R (mild S + moderate R)	mild R	33	.		.	
3	moderate R	-	-	20	.			.
4	BioP (mild R)	mild R	mild R	30		.		.
5	-	S+R (mild S + mild R)	-	26	.		.	
6	S+R (moderate S + mild R)	mild R	mild R	34		.		.
7	S+R (mild S + mild R)	moderate R	mild R	30	.			.
8	normal BioP	normal BioP	mild R	32	.		.	
9	moderate R	severe R	mild R	31		.	.	
10	S+R (mild S + mild R)	S+R (moderate S + mild R)	-	34		.		.
11	severe R	mild R	mild R	22	.		.	
12	normal BioP	-	mild R	44	.			.
13	moderate S	S+R (mild S + mild R)	-	35	.			.
14	BioP (mild R)	moderate R	mild R	25	.		.	
15	S+R (moderate S + severe R)	-	mild R	23	.		.	
16	severe R	mild R	mild R	22	.		.	
17	normal BioP	-	mild R	32	.		.	
18	S+R (mild S + mild R)	S+R (mild S + mild R)	mild R	27	.			.
19	mild R	S+R (severe S + moderate R)	-	34	.			.
20	S+R (mild S + mild R)	S+R (mild S + mild R)	-	28	.			.
21	mild R	mild R	-	22	.		.	
22	moderate R	mild R	-	23	.		.	
23	BioP (mild R)	mild R	mild R	24	.			.
24	BioP (severe R)	-	mild R	24	.			.
25	S+R (mild S + mild R)	-	-	26	.		.	
26	S+R (mild S + severe R)	-	moderate R	33	.			.
27	moderate S	mild R	-	35	.			.
28	S+R (mild S + severe R)	-	-	31	.		.	
29	normal BioP	moderate R	moderate R	27	.			.
30	moderate R	-	-	24	.		.	
31	mild R			18	.			.

MiV - mitral valve; AoV - aortic valve; TrV - tricuspid valve; BioP - bioprosthesis; S+R - stenosis + regurgitation; R - regurgitation; S - stenosis; LPE - lidocaine plus epinephrine 1:100,000; LWE - lidocaine without epinephrine.

the patient left the dental chair. Thus, we obtained P2H, P2A and P2C relative to Holter monitoring, ABPM and CTG, respectively.

At P0 the patients remained sitting and at P1 and P2 on the dental chair at a standard 45° angle, leaning the abdomen slightly to the left, so as to prevent uterine compression of the inferior vena and possible reduction of the cardiac output.

With 24-hour recordings, P24H of Holter monitoring, and sleep (SPA) and wake (WPA) periods of ABPM were obtained according to the times reported by the patients in the respective diary of events.

The ABPM monitor was programmed to obtain readings every 10 and 20 minutes during the wake and sleep periods, respectively. The events key was pressed at the initial and final moments of P0M, P1A and P2A. Four to seven readings of systolic BP (SBP) and diastolic BP (DBP) were obtained from each patient at P0A, three to nine readings at P1A which ranged from 33 to 102 minutes, and two to four readings at P2A. The analysis was made using the Doctor Pro software (TM-2430-12). Individual means were calculated, and then the sample and group means; the minimum and maximum SBP and DBP values from the sample and from the LPE and LWE groups were identified in P0A, P1A and P2A. Individual mean WPA and SPA were calculated by the program.

Holter recording was programmed for analysis in three channels and was analyzed by the Cardioscan 10 software (a version of the Premier 10 software). The events key was pressed at the same moments as for ABPM. The electrocardiographic variables studied were: heart rate (HR), supraventricular extrasystoles (SVE), and ventricular extrasystoles (VE). From the calculation of the individual mean HR, the means were calculated and the minimum and maximum sample values were identified in the LPE and LWE groups in P0H, P1H and P2H. The individual mean P24H was calculated by the software. The number of individual SVE and VE per minute was identified and then added, and the means of each period studied were also calculated. A more detailed analysis considered only the presence of ≥ 10 SVE and VE per hour[12] in the same groups and periods.

The two cardiotocograph transducers – the cardiac transducer and tocodynamometer, placed on the patient's abdomen allowed continuous recording of the fetal HR (FHR), maternal uterine contractions (MUC) and fetal body movements (FBM) in thermosensitive paper. For the interpretation of CTG, a non-stress test (NST) was used, which is classified in: (1) reactive pattern – presence of two or more transient FHR accelerations and (2) non-reactive pattern – absence of at least two transient FHR accelerations every 20 minutes. For this purpose, the variables MUC, FBM, FHR in relation to baseline level and variability, and number of transient accelerations and decelerations were analyzed in P0C, P1C, and P2C individually, in the sample and in the LPE and LWE groups, using established guidelines and standards[13].

Statistical analysis

For this randomized controlled clinical trial, the analysis of variance (ANOVA) with repeated measures was used for calculation of the sample size and for the analysis and multiple interpretation of the variables in the three different periods, based on an established table[14]. Data were analyzed in the SAS program version 6.1 for Windows, from data compiled in Excel spreadsheets.

The Student's t test was used for comparison between two groups in relation to the means. When the normality assumption was rejected, the non-parametric Mann-Whitney test was used. For comparison between three or more groups, the non-parametric Kruskal-Wallis test was used whenever the data normality assumption was rejected. The Fisher's exact test was used to test the homogeneity of the groups in relation to proportions. To analyze the behavior of the groups considering the different conditions studied, the non-parametric Friedman test was used whenever the data normality assumption was rejected. The paired Student's t test was used whenever only two assessment conditions were considered.

The significance level (p) for the tests was set at 5%.

Results

The mean duration of the restorative procedure was 56 ± 15.5 minutes, ranging from 47 to 97 (56 ± 14.3) minutes in the LWE group and from 33 to 102 (56 ± 17.0) minutes in the LPE group (p=0.902). No clinical complications occurred in any of the two groups.

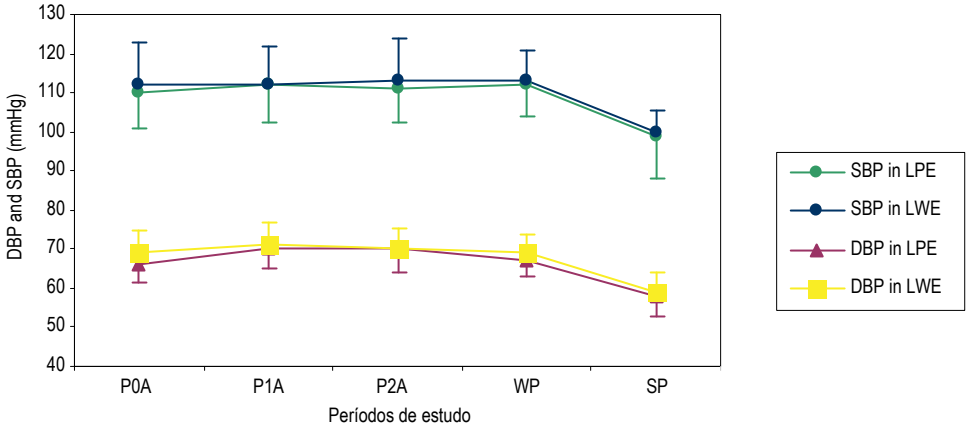
A total of 30 cases were considered for the analysis of P0A, P1A and P2A, and 29 cases for the analysis of WPA and SPA. The number of measurements was sufficient for the analysis of the sample and of the anesthetic groups in each one of the standardized periods.

The comparative analysis between the LWE and LPE groups did not show SBP (1 to 2mmHg) and DBP (1 to 4mmHg) changes (p>0.05) between the respective periods and between periods in the same group (Graph 1). In the comparison of WPA and SPA in the LWE and LPE groups, SBP (13mmHg) and DBP (9 to 10mmHg) changes showed significance only when WPA and SPA of the same group were compared (p<0.001) (Graph 1).

The 31 Holter monitoring tests were considered valid since they did not show loss of information greater than 2%. A significant (p<0.001) HR reduction (4 to 6 bpm) was observed in the comparison of P1H with P0H, P1H with P2H, and P1H with P24H, both in the LWE and LPE groups. No difference (p=0.815) of mean HR between the LWE and LPE groups was observed (Graph 2).

Mean HR at 5, 10 and 20 initial minutes of P1H were similar (p>0.05) to those of full P1H, when the LWE and LPE groups were compared.

VE occurred in 22 (70.9%) patients and SVE in 23 (74.2%); ≥ 10 extrasystoles per hour occurred in nine (29%) patients, seven of whom were from the LPE group, corresponding to 41.8% of the 17 patients in this group, whereas the other two (14.29%) were from the LWE group. No differences (p=0.132) were observed in the comparison of periods. At baseline, these extrasystoles occurred in eight (88.89%) of the nine patients, of whom six (85.71%) were from the LPE group, with no difference (p=1.000) in the comparison between



SBP	Comparison of the two groups	p=0.5587
	Comparison of the respective periods	p=0.6538
	Comparison of periods in the same group	p=0.7733
PAD	Comparison of the two groups	p=0.7836
	Comparison of the respective periods	p=0.3664
	Comparison of periods in the same group	p=0.1200

Situations compared between study groups LPE and LWE	Descriptive level of significance	
	SBP	DBP
Comparison of the two groups in relation to P0A, P1A and P2A	p=0.5587	p=0.7836
Comparison between P0A or P1A or P2A of the two groups	p=0.6538	p=0.3664
Comparison between P0A, P1A and P2A of the same group	p=0.7733	p=0.1200
Comparison of the two groups in relation to WP and SP	p=0.9336	p=0.9578
Comparison between WP or SP of the two groups	p=0.6544	p=0.3731
Comparison between WP and SP of the same group	p<0.001	p<0.001

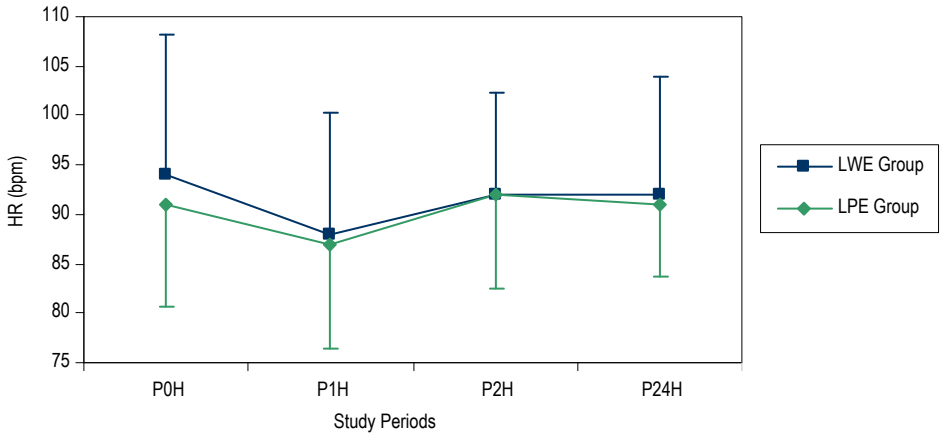
Graph 1 - *Graphic representation of means and standard deviations of systolic (SBP) and diastolic blood pressure (DBP) in the LPE (lidocaine plus epinephrine 1:100,000) and LWE (lidocaine without epinephrine) groups according to the following periods: baseline (P0A), procedural (P1A), post-procedural (P2A), wake (WP) and sleep (SP).*

groups. During the procedure, eight out of the nine pregnant women who presented VE and/or ≥10 SVE/h were from the LPE group, with a significant difference in relation to the LWE group (p=0.003).

In relation to CTG, the analysis of baseline FHR level of LPE (142 to 146 bpm ± 10.2 to 11.7) did not show differences (p=0.121) in the periods studied, and the same occurred in LWE (143 to 145 bpm ± 5.3 to 10.04) (p=0.904). Comparisons between the respective periods of the groups were not different either (p>0.05) (Graph 3). As regards FHR baseline variability, no difference (p=0.234) was observed in the comparative analysis of the LPE periods (13.0 to 16.7 bpm ± 4.2 to 5.9). No difference (p=0.777) was observed in the LWE group either (12.3 to 15.5 bpm ± 1.1 to 6.7). Comparisons between the respective periods of the groups did not show significant differences (p>0.05) (Graph 4).

The comparative analysis of the MUC periods did not show differences in the LPE group (1.4 to 2.1 ± 2.5 to 3.0) (p=0.590) nor in LWE (0.1 to 0.5 ± 0.4 to 0.8) (p=0.216). Comparisons between the respective periods of the groups did not show differences either (p>0.05) (Graph 5).

The analysis of the number of accelerations of FHR in the LWE periods (2.8 to 4.1 ± 1.7 to 2.5) did not show differences (p=0.266). The same occurred in LWE (2.2 to 3.6 ± 1.0 to



Situations compared between study groups LPE and LWE	Descriptive level of significance
Comparison of the two groups in relation to P0H, P1H and P2H	p=0.5366
Comparison between P0H or P1H or P2H of the two groups	p=0.7599
Comparison between P0H, P1H and P2H of the same group	p<0.001
Comparison between P0Hand P1H of the same group	p<0.001
Comparison between P1H and P2H of the same group	p<0.001
Comparison between P0H and P2H of the same group	p=0.5492
Comparison of the two groups in relation to P24H	p=0.8150

Graph 2 - *Graphic representation of heart rate (HR) means in the baseline (P0H), procedural (P1H), post-procedural (P2H), and 24-hour (P24H) periods according to the LPE (lidocaine plus epinephrine 1:100,000) and LWE (lidocaine without epinephrine) groups.*

1.7) (p=0.350). Comparisons between the respective periods of the groups did not show significant differences (p>0.05) (Graph 5).

The analysis of FHR decelerations showed the occurrence of two decelerations in P0C and $P1C_3$ of one pregnant woman of the LWE group. NST found a mean of 10.4 (78.4%) and 11.8 (73.4%) of tests with a reactive pattern in the LPE and LWE groups, respectively, and two (15.4%) and 3.6 (21.5%) with a non-reactive pattern in the LPE and LWE groups, respectively. Two (0.8%) tests, one of each study group, could not be interpreted. No statistical difference was observed when the same periods were compared for the two groups (p>0.05).

The full study is available at www.teses.usp.br.

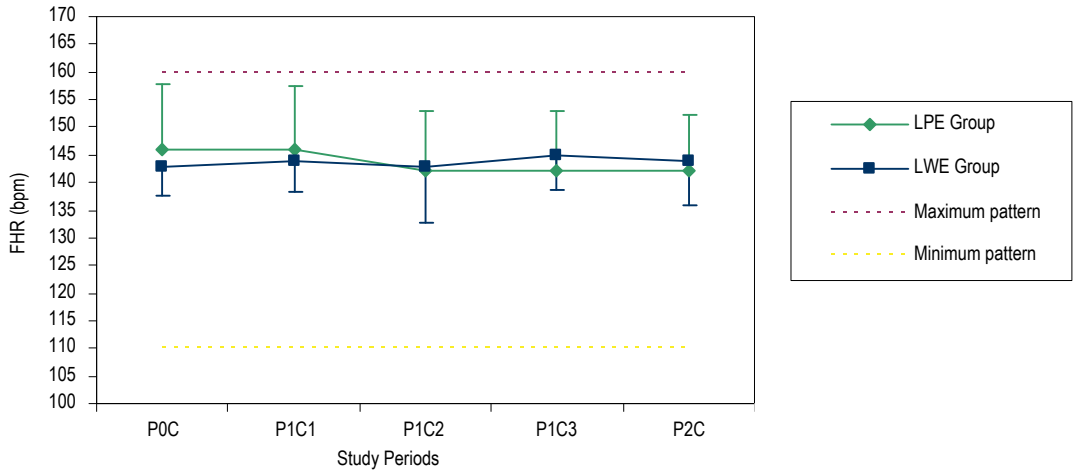
Discussion

A factor that aggravates the physiological hemodynamic overload during pregnancy in women with heart valve disease is the risk of infective endocarditis[11], which makes the preservation of oral health fundamental to minimize materno-fetal morbidity and mortality.

However, dental procedures of women with heart valve disease during pregnancy are a matter of concern regarding the materno-fetal risk, both because of the dental procedure itself and of the implicit local anesthesia. The combination of vasoconstrictors with anesthetic agents used in dentistry is known to be efficient; however, there is uncertainty as to whether their administration in pregnant women with heart valve diseases is safe.

Nonetheless, the findings of the present study showed that the combination of epinephrine 1:100,000 with lidocaine 2% solution did not interfere with maternal BP and HR, nor with FHR, MUC, FBM and NST when 1.8 mL of the solution was infused using the modified periodontal ligament injection technique, which was thus proven to be appropriate for the selected restorative procedure given its efficacy in pain block during the dental intervention. The finding of a higher frequency of arrhythmias, considered in this study as more than 10 extrasystoles per hour, in patients who received epinephrine could support the hypothesis that the 0.018 mg dose of epinephrine leads to an adrenergic response. However, also in proportion, these patients presented a higher number of extrasystoles in the 24 hours.

The patients included in this study were normotensive. They presented SBP and DBP values in the wake period similar to those verified before pregnancy, according to



Situations compared between study groups LPE and LWE	Descriptive level of significance
Comparison of periods in LPE	p=0.121
Comparison of periods in LWE	p=0.904
Comparison of the respective periods of the 2 groups	p>0.005

Graph 3 - Graphic representation of mean fetal heart rates (FHR) of the LPE and LWE groups according to the study periods : baseline (P0C), 20 initial minutes of procedure (P1C1), 20 following minutes (P1C2), 20 final minutes of procedure (P1C3) and post-procedural (P2C).

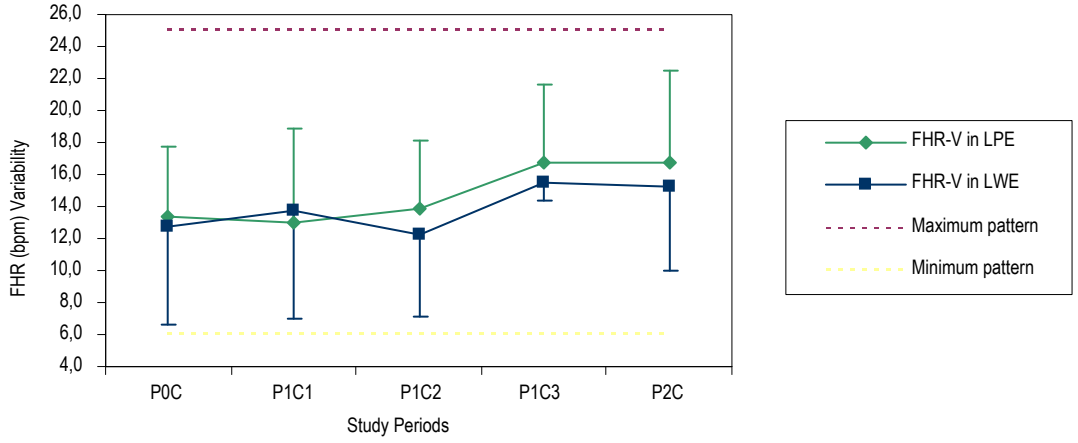
retrospective data obtained from their medical records. This is consistent with the literature that shows a reduction in SBP from the beginning until half of the pregnancy (24 weeks), and elevation from the second half until term, when pre-gestational levels are reached, whereas DBP remains reduced by 10% until term[15,16].

We found studies in the literature whose designs were different from ours, with samples comprised of healthy individuals or of individuals with heart diseases of different etiologies, but none conducted in pregnant women. Meyer[17] studied 60 healthy individuals, assessed in three visits, who received a different type of anesthetic solution in each visit. The individuals were divided into two randomized groups and assigned to receive 4mL of anesthetic solutions of: lidocaine without vasoconstrictor, lidocaine plus epinephrine 1:100,000, and lidocaine plus norepinephrine 1:50,000. One group received only the injection, and the other underwent tooth extraction in addition to the injection in each of the three visits; BP and HR changes were compared 5 minutes before, during and up to 12 minutes after the procedure. The author concluded that anxiety and fear triggered by the surgical procedure accounted for the significant increase in BP and HR, in comparison with the stable behavior of these parameters found in the group receiving only the injection. However, in our study no BP change was observed, and HR was significantly reduced during the procedure in comparison with the baseline period, post-procedural period and mean of 24 hours both in the LWE and LPE groups. We point out that the procedure performed in our study was not surgical but restorative, which is also considered to cause stress and anxiety in the patient, as was demonstrated in Gortzak et al[18], in which 40 healthy individuals underwent restorative treatment and only 15 received anesthesia. The authors observed a significant increase of BP in the group not receiving anesthesia in comparison with the group receiving anesthetic agent plus epinephrine.

In Niwa et al[19], 27 patients with different heart diseases underwent dental treatment with 1.8mL of lidocaine 2% plus epinephrine 1:80,000; BP and HR were analyzed in the three groups and the patients were classified according to the NYHA in functional class I, II or III. The changes were not significant and led the authors to conclude that this volume and concentration of lidocaine and epinephrine is safe in these patients. Although the analysis had been performed according to the functional class, the limitation of this study is that the responses may be different because of the risks related to the etiology of the existing heart disease and, therefore, the sample size was too small for a generalization of the conclusions.

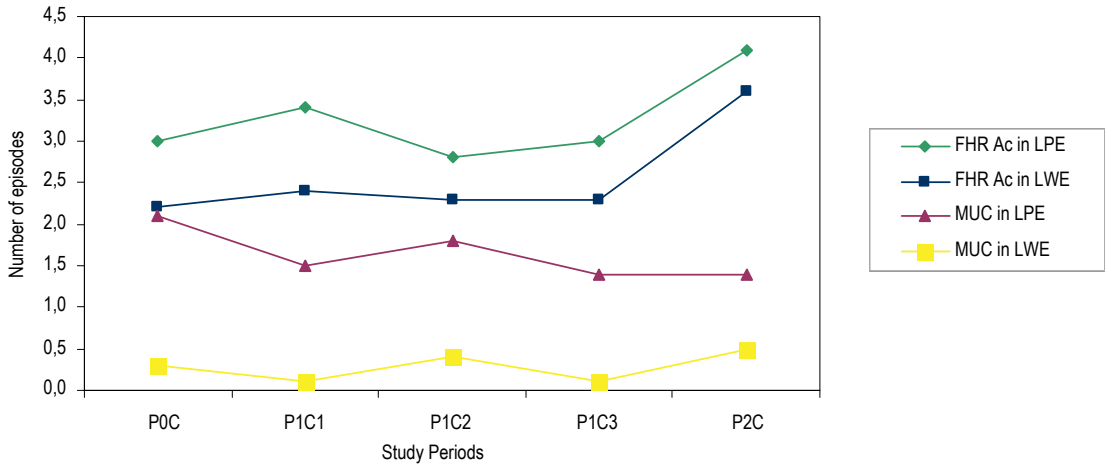
Neves et al[20] emphasized the importance of a rigorous homogenization of the sample, when they analyzed BP and HR of 62 patients with severe coronary artery disease undergoing restorative treatment with lidocaine with and without epinephrine 1:100,000. The authors concluded that there was no difference in BP and HR behavior in the presence or absence of vasoconstrictor.

The differences between our findings and those of Meyer's[17], Gortzak et al[18] and Niwa et al[19] seem to be related to the



Situations compared between study groups LPE and LWE	Descriptive level of significance
Comparison of periods in LPE	p=0.234
Comparison of periods in LWE	p=0.777
Comparison of the respective periods in the 2 groups	p>0.005

Graph 4 - Graphic representation of means and standard deviations of baseline level variability of fetal heart rate (FHR-V) in the baseline (P0C), procedural (P1C1, P1C2, P1C3) and post-procedural (P2C) periods according to the LPE (lidocaine plus epinephrine 1:100,000) and LWE (lidocaine without epinephrine) groups.



Situations compared between study groups LPE and LWE	Descriptive level of significance	
	FHR Ac	MUC
Comparison of periods in LPE	p=0.266	p=0.590
Comparison of periods in LWE	p=0.350	p=0.216
Comparison of the respective periods in the 2 groups	p>0.005	p>0.005

Graph 5 - Graphic representation of mean fetal heart rate accelerations (FHR Ac) and maternal uterine contractions (MUC) in the baseline (P0C), procedural (P1C1, P1C2, P1C3) and post-procedural (P2C) periods according to the LPE (lidocaine plus epinephrine 1:100,000) and LWE (lidocaine without epinephrine) groups

sample homogeneity and to the effectiveness of the resources for anxiety and pain control which were valued in this study. No significant changes were observed in BP, FHR, MUC, FBM and NST, thus showing that lidocaine with or without epinephrine, at the volume used in the modified periodontal ligament injection, did not induce variations of these parameters in pregnant women with rheumatic heart valve disease and their fetuses. The mean HR in the two groups and periods studied was consistent with the literature as regards the normal increase in the number of bpm by approximately 20% close to the end of pregnancy[21-23]. The significant reduction in HR by 4 to 6 bpm during the procedure is not representative in the clinical context, but is inconsistent with the literature which shows a sometimes significant elevation of HR resulting from the use of anesthetic agents containing vasoconstrictor[24] or from the performance of dental procedures[17].

Conclusions

The comparison of the groups of pregnant women with rheumatic heart valve disease who received local anesthesia with lidocaine 2% with or without epinephrine 1:100,000 showed: (1) no change in systolic and diastolic blood pressure; (2) decreased heart rate during the procedure; (3) no change in heart rate in the other comparisons between periods and groups; (4) no variation of fetal heart rate and maternal uterine contraction. On the other hand, the group receiving epinephrine showed a certain tendency for the occurrence of ventricular and supraventricular extrasystoles before, during and after the procedure. No clinical events were recorded throughout the materno-fetal monitoring.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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