ANESTHETIC MANAGEMENT OF PREGNANT PATIENTS WITH APPENDECTOMY

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Abstract

Our goal was to present our anesthesia procedure of pre-diagnosis and laparotomy on pregnant patients with acute appendicitis.

After approval Ethics Committee, 77 pregnant patients with a diagnosis of acute appendicitis were evaluated. Patients were separated into two groups: group G (general anesthesia) and Group S (spinal anesthesia), according to the method of anesthesia applied. The patients' age, gestational age, method of anesthesia applied, duration of hospital stay, duration of anesthesia, number of pregnancies, leukocyte count and complications suffered were compared between the groups. After the surgery, with regular and adequate spontaneous respiration, protective airway reflexes present, and with vital parameters normal and within clinical limits, the patients were sent for internal evaluations.

The demographic information of the cases is shown in table 1. In comparing the groups, the hospital stay duration of group S was significantly short. Looking at the incisions made for the surgical procedures, in group S relative to the pararectal incision average, the McBurney incision average was greater. In group G, the number of perforated appendicitis cases was higher. The anesthesia duration was short to a significant degree in group S.

In order to protect the mother and baby from the negative effects of general anesthesia, as well as to lower costs by decreasing the duration of stay in the hospital, the spinal anesthesia technique could be a preferable procedure for selected pregnant acute appendicitis patients.

G: general anesthesia, S: spinal anesthesia.

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Introduction

One of the most common diseases requiring non-obstetric surgical intervention during pregnancy is acute appendicitis. Life-threatening to both the mother and the fetus, the condition of acute appendicitis occurs in pregnant and non-pregnant women at the same rate, of 0.1 to 0.2 percent[1].

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Acute appendicitis most commonly occurs in the third trimester of pregnancy. Due to delays in diagnosis because of the physiological and anatomical changes that occur in pregnancy as well as the varying clinical symptoms, the illness can develop into a major threat to the mother as well as the fetus. Because this affects all surgical interventions done to the mother and also affects the baby, surgery and anesthesia procedures conducted during pregnancy are of particular concern.

Every sort of practice necessary to perform surgery, the chosen anesthetic technique and other medicines used with the anesthetic agents, as well as the variables in the hemodynamic conditions of the pregnant woman during the course of the operation constitute a significant risk to the mother as well as the

baby[2,3,4]. In the literature there are no studies comparing general and spinal anesthesia during appendicitis in pregnancy.

In this study conducted at our center, our goal was to present our anesthesia procedure of pre-diagnosis and laparotomy on pregnant patients with acute appendicitis.

Materials and methods

Dicle University Research Hospital after approval was obtained from the Ethics Committee, 77 pregnant patients who underwent an operation at the Tigris University Faculty of Medicine Department of General Surgery with a diagnosis of acute appendicitis were evaluated.

They were separated into two groups: group G (general anesthesia) and Group S (spinal anesthesia), according to the method of anesthesia applied. The patients' age, gestational age, method of anesthesia applied, duration of hospital stay, duration of anesthesia, number of pregnancies, leukocyte count and complications suffered were compared between the groups.

All the patients were given IVs, and also provided with ECG, SpO_2, and non-invasive blood pressure monitoring. After the surgery, the patients were taken to the recovery room. With regular and adequate spontaneous respiration, protective airway reflexes present, and with vital parameters normal and within clinical limits, the patients were sent for internal evaluations.

Statistical Analysis; Statistical analysis was performed using the SPSS for Windows software package (SPSS Inc., Chicago, IL, USA). The mean and standard deviation were calculated for descriptive statistics of constant variables. Compatibility of groups to a normal distribution was determined using the Kolmogorov-Smirnov test. The non-normally distributed persons were analyzed using the Mann Whitney test, while the normally distributed persons were compared using the student T-test. For comparing the categorical data, the Yates correction and chi-squared tests were applied. *P* value less than 0.05 was deemed to indicate statistical significance.

Results

The demographic information of the cases included in the study is shown in table 1.

		Group G (n=28)	Group S(n=49)	*p*
Age (year)		28.25 ± 6.38	29.88± 6.68	0,29
Number of pregnancies		1.82±1.19	2.29±1.09	0.08
Gestational age		18.00 ± 7.97	17.02 ± 7.80	0.61
Leukocyte		14.83±3.84	13.70±2.84	0,14
Duration of anesthesia		92.12±9.45,	58.23±8.07	0,04*
Duration of hospital stay		3.89 ± 2.18	3.14 ± 1.78	0,04*
Incisions	*McBurney*	24	48	X^2 =0.04 p=0.04*
	Pararectal	4	1	
Pregnancy trimesters	1 trimester	6	14	X^2 =0.73 p=0.43
	2 trimester	18	30	
	3 trimester	4	5	

Table 1. Demographic data of patients.
** statistical significance.*
Values are given as mean±standart deviation.
S: Spinal Anesthesia
G: Genel Anesthesia
X^2: chi-squared test
1 trimester; first trimester. 2 trimester; second trimester. 3 trimester; third trimester.

With respect to the patients' age, number of pregnancies, the week of their pregnancies, and their preoperative phase leukocyte counts, there was no statistical difference between the two groups.

In comparing the groups, the hospital stay duration of group S was significantly short (*p*=0,04).

In terms of the pregnancy trimesters, there was no significant difference between the groups (X^2 =0.73 p=0.43).

Looking at the incisions made for the surgical procedures, in group S relative to the pararectal incision average, the McBurney incision average was greater (X^2=0.04, p=0.04) (table 1).

The complications which occurred among the patients are shown in table 2.

Parameters	Group G (n=28)	Group S (n=49)	
Nausea			
0 (-)	18	35	X^2=0.61 p=0.34
1 (+)	10	14	
Vomiting			
0 (-)	27	45	X2=0.64 p=0.40
1 (+)	1	4	
Perforation			
0 (-)	17	44	X^2=0.004 p=0.004*
1 (+)	11	5	
Morbidity			
Infection	0	1	X^2=0.72 p=0.57
ARDS	0	1	

Table 2. Complications of Patients.

** statistical significance.*
Values are given as mean±standart deviation.
S: Spinal Anesthesia
G: Genel Anesthesia
X^2: chi-squared test
ARDS; Acute Respiratory Distress Syndrome

In group G, the number of perforated appendicitis cases was higher ($X^2=0.004$, $p=0.004$) (Table 2).

The anesthesia duration was short to a significant degree in group S ($p=0,04$)

Discussion

Although it occurred rarely during pregnancy, acute appendicitis is one of the leading causes for acute stomach problems - developing during pregnancy. Although its occurrence frequency varies, the phenomenon of acute appendicitis is encountered in an average of 1 out of every 5000 pregnancies[5].

Because it has an effect on the mother as well as the baby, the surgical procedure as well as the type of anesthesia conducted during pregnancy is quite important. Maternal hypoxia, hypotension, and hypovolemia may develop, which can lead to acidosis, as well as unexpected abortions following surgical manipulation, premature occurrences, and low birth weight[2,6]. For this reason, anesthetists must maintain the mother's physiology, the uteroplacental blood flow, and the oxygen supply in the best possible condition, and protect the fetus from undesired effects of medications.

Both regional as well as general anesthetic techniques can be applied successfully on pregnant women. Regional anesthesia lowers the risk of unsuccessful entubation and aspiration, minimizes the effect of medications on the fetus, decreases blood loss, and decreases the potential of teratogenicity[7].

In this study, 36.4% (28) of the patients underwent general anesthesia, while 63% (49) of them underwent spinal anesthesia.

Although acute appendicitis may occur in any of the three trimesters of pregnancy, there is no consensus on which trimester it occurs most frequently. Studies done on this subject indicate that acute appendicitis most frequently occurs in the third trimester[1,5]. In this study 84.6% of cases occurred in the second and third trimester.

In the first trimester of pregnancy (15-90 days) during the stage when the baby's organs are developing, as well as during the second trimester when the baby's central nervous system is undergoing myelization, it is recommended that particular care be exercised in using inhalation agents[8]. In this study, the application rate for spinal anesthesia during the first and second trimesters appears to be higher than that for general anesthesia.

Another anesthesia-related risk to be feared during pregnancy is a possible early birth, i.e. preterm delivery. However, there is no support that any particular anesthetic agent or technique increases the risk of premature birth[6,9]. In our study, abortion occurred in two cases. One of these occurrences was in group S, and the other in group G. Relative to one another, the anesthesia techniques showed no particular superiority relative to the risk of abortion.

In the studies done by Yağcı et al. on the subject of acute appendicitis during pregnancy, the hospital stay duration for the patients subjected to general anesthesia averaged 5.1 days, whereas Jung et al. found this same duration to be 6.2 days[10,11]. In this study, the average hospital stay was found to be longer for the group G spinal anesthesia group. (3.89±2.18 for the general anesthesia group and 3.14±1.78 for the spinal anesthesia group).

Because it provides easy access during the appendicitis surgery procedure and has a low morbidity rate, the McBurney incision procedure is most frequently preferred by surgeons. General anesthesia, meanwhile, is more widely applied in cases of perforated appendicitis. In our study, general anesthesia and the pararectal incision was preferred for perforated appendicitis cases, while for non-perforated appendicitis cases spinal anesthesia and the McBurney incision was preferred.

For the general anesthesia group, the anesthesia durations were found to be longer than those of the spinal anesthesia group. It is possible that the length of this duration could be due to our preference for general anesthesia for perforated appendicitis cases.

Conclusions

In conclusion, general anesthesia, as well as spinal anesthesia, provide a safe form of anesthesia for pregnant acute appendicitis patients. As a result, in order to protect the mother and baby from the negative effects of

general anesthesia, as well as to lower costs by decreasing the duration of stay in the hospital, the spinal anesthesia technique could be a preferable procedure for selected pregnant acute appendicitis patients.

Declaration of Interest

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