

## Research Article

**Oxytocin 10 IU as Prophylactic for Uterine Atony : a Randomized Clinical Trial****Oksitosin 10 IU sebagai Profilaksis Atonia Uteri : suatu Uji Coba Klinis Acak****Ridwan A. Putra<sup>1</sup>, Iskandar Zulqarnain<sup>1</sup>, Zaimursyaf Azis<sup>1</sup>  
Jusuf S. Effendi<sup>2</sup>, Wiryawan Permadi<sup>2</sup>, Ria Bandiara<sup>3</sup>**<sup>1</sup>Department of Obstetrics and Gynecology  
Faculty of Medicine Universitas Sriwijaya  
Dr. Mohd. Hoesin Hospital, Palembang<sup>2</sup>Department of Obstetrics and Gynecology<sup>3</sup>Department of Internal Medicine  
Faculty of Medicine Universitas Padjajaran  
Dr. Hasan Sadikin General Hospital, Bandung**Abstract**

**Objective :** To compare the effectiveness of oxytocin dose of 10 IU and 20 IU for preventing uterine atony in women undergoing cesarean section.

**Methods :** This was a double-blind, randomized clinical trial with good matching selection with randomization block of patients who had risk factors for the occurrence of uterine atony such as preeclampsia, patients were receiving MgSO<sub>4</sub>, oxytocin intrapartum and chorioamnionitis who performed stratified randomization prospectively with two kinds of oxytocin doses which are 10 IU and 20 IU as a prophylaxis for uterine atony in women who performed emergency cesarean section with transverse incision and were using a general anesthesia.

**Results :** This study found no any significant differences between the use of 10 IU and 20 IU as prophylaxis for uterine atony during cesarean section either in its action at the time or while in recovery room, especially on the cases without chorioamnionitis thus using oxytocin 10 IU regimen can be considered, besides the effectiveness did no differ, it will cost cheaper than oxytocin 20 IU regimen which frequently used.

**Conclusions :** There were no significant differences in the incidence of blood loss during the cesarean section between the treatment of oxytocin 10 IU group and oxytocin 20 IU group. The additional uterotonic was using during the action of the cesarean section between the treatment of oxytocin 10 IU group, and oxytocin 20 IU group gave no significant differences. The side effects in this study at least form of chills and vomiting found no significant differences between both of groups despite the side effects that arise in oxytocin 20 IU group was higher at 23.08% than oxytocin 10 IU group at 15.19%. Chorioamnionitis would be a risk factor for the occurrence of uterine atony during the action of the cesarean section if it associated with the use of additional uterotonic in oxytocin 10 IU group if compared with oxytocin 20 IU group.

**Keywords :** cesarean section, oxytocin, uterine atony.

**Abstrak**

**Tujuan :** Untuk membandingkan efektifitas penggunaan dosis 10 IU dan 20 IU sebagai profilaksis atonia uteri pada saat seksio sesarea.

**Metode :** Penelitian ini menggunakan uji klinis acak ganda dengan seleksi yang sesuai dengan blok acak pada pasien-pasien yang memiliki faktor risiko terjadinya atonia uteri seperti preeklamsia, pasien yang diberikana MgSO<sub>4</sub> dan oxytocin intrapartum sebelumnya serta chorioamnionitis yang dilakukan pengacakan secara prospektif bertingkat yang diberikan dua jenis dosis oksitosin yaitu 10 IU dan 20 IU sebagai profilaksis atonia uteri pada perempuan yang dilakukan seksio sesarea darurat dengan insisi transversal dan menggunakan anestesi umum.

**Hasil :** Penelitian ini menemukan tidak adanya perbedaan yang bermakna antara penggunaan dosis oksitosin 10 IU dan 20 IU sebagai profilaksis atonia uteri pada seksio sesarea baik saat tindakan operasi maupun saat berada di ruang pemulihan, terutama pada kasus-kasus tanpa khorioamnionitis dimana memerlukan oksitosin tambahan pada kelompok 10 IU, selain efektifitasnya tidak berbeda, akan lebih murah dari pada rejimen oksitosin 20 IU yang sering digunakan saat ini.

**Kesimpulan :** Berdasarkan hasil penelitian ini, tidak ada perbedaan yang bermakna dalam kejadian kehilangan darah selama operasi seksio sesarea antara perlakuan kelompok oksitosin 10 IU dan kelompok oksitosin 20 IU. Penggunaan uterotonik tambahan selama tindakan seksio sesarea antara perlakuan kelompok oksitosin 10 IU dan kelompok oksitosin 20 IU tidak memberikan perbedaan yang signifikan. Efek samping dalam penelitian ini yakni menggigil dan muntah, tidak ditemukan perbedaan yang bermakna antara kedua kelompok meskipun efek samping yang muncul pada kelompok oksitosin 20 IU lebih tinggi 23,08% dibandingkan kelompok oksitosin 10 IU pada 15,19%. Khorioamnionitis merupakan faktor risiko terjadinya atonia uteri selama tindakan seksio sesarea jika dikaitkan dengan penggunaan uterotonika tambahan pada kelompok oksitosin 10 IU jika dibandingkan dengan kelompok oksitosin 20 IU.

**Kata kunci :** atonia uteri, oksitosin, seksio sesarea.

## INTRODUCTION

The labour is a culmination point of the human reproduction process by women after pregnancy over the course of time and a certain period. Postpartum haemorrhage is one of the leading causes of morbidity and mortality in mothers. In Indonesia, the causes of maternal death of mothers are haemorrhage (67%), infection (8%), toxemia gravidarum (7%) and abortus (10%).<sup>1-3</sup> The cases of postpartum haemorrhage were mostly caused by uterine atony, which is about 50 – 60% that can be prevented. The General Hospital Central Palembang, reported since 1986–1989 of 12.476 deliveries with 67 maternal deaths are cases of haemorrhage 36,6% with 10% of them are caused by uterine atony.<sup>3</sup>

The postpartum haemorrhage is most often defined as a state of blood loss from 500 mL – 600 mL in vaginal delivery during the first 24 hours after birth and 1000 mL at delivery by cesarean section. Various risk factors have a significance, by itself and by the combination that causing the bleeding postpartum, which are placenta previa, placental abruption, twin pregnancy, weight of birth is 4000 g or more, obesity, the kind of anesthesia that used, induction of labour, gave birth with an action, infection and obstacles in the progress of labour. Besides the vaginal laceration, the cause of bleeding commonly found is hypotonic myometrium.<sup>3-6</sup>

The existence of uterine atony has been thought would increase the postpartum haemorrhage. The uterine atony is a significant contribution to the occurrence of blood loss, especially after the action of cesarean section.<sup>4-5</sup> Oxytocin has been widely used to prevent the uterine atony after childbirth.<sup>7-12</sup> The use of oxytocin, during the action of cesarean section to prevent uterine atony, is mostly based on experiences and only focus on vaginal delivery regimen guidance.

This study is meant to compare the effectiveness of oxytocin dose of 10 IU and 20 IU as prophylactic uterine atony in cesarean section. Comparing the incidences of bleeding that occurs, changes of hemoglobin level, hematocrit level and hemodynamic function and determine the use of additional uterotonic after treatment

on both of oxytocin groups, to know the side effects that arise and identify the risk factors of uterine atony in the action of cesarean section against both of those oxytocin groups.

## METHODS

This study was conducted with mothers that decided to deliver with an emergency transperitoneal cesarean section. Subjects were women with 22 weeks of pregnancy or more who went into labour.

### Clinical Examination Methods

This study was using double-blind, randomized clinical trial with good matching selection with 6 randomization block of patients who had risk factors for the occurrence of uterine atony such as preeclampsia, patients were receiving MgSO<sub>4</sub>, oxytocin intrapartum and chorioamnionitis who performed stratified randomization prospectively with two kinds of oxytocin doses which are 10 IU and 20 IU as prophylactic of uterine atony in women who underwent emergency transperitoneal cesarean section.

### Laboratory Examination Methods

Measurement of haemoglobin concentration, hematocrit and leukocyte in units of g% for haemoglobin, vol% for hematocrit and mm<sup>3</sup> for leukocyte with machine Cauter Mode DTH2 AS. Manufactured by Cauter Corporation. Avenue, Miami. USA.

### Data Analyst

The variables studied were oxytocin 10 IU and 20 IU, age, parity, birth weight, an indication of cesarean section, the amount of bleeding, the use of additional uterotonics (oxytocin, methyl ergotamine, misoprostol), duration of operating time, side effects, blood transfusions, blood pressure, pulse, temperature, hemoglobin and hematocrit level, the use of MgSO<sub>4</sub>, oxytocin intrapartum, clinical chorioamnionitis, duration of membrane rupture.

## RESULT

Based on the statistical analysis, there were no differences in mean age in both groups ( $p > 0.05$ ).

**Table 1.** Characteristic of the Subjects

Characteristic	Oxytocin 10IU		Oxytocin 20IU		Mean ± SD
	n	n%	n	n%	
Age (years old)	29.39 ± 6.17		29.45 ± 5.74		29.42 ± 5.938*
<b>Education</b>					
No School/not completed elementary	7	8.9	8	10.3	
Elementary School	25	31.6	26	33.3	
Junior High School	15	19.0	21	26.9	
Senior High School	19	24.1	13	16.7	
Academy	9	11.4	3	3.8	
University	4	5.1	7	9.0	
<b>Occupation</b>					
No Job	41	51.9	43	54.8	
Labor	2	2.5	4	2.5	
Farmer	8	10.1	7	9.6	
Trader	7	8.9	8	9.6	
Private Employees	9	11.4	4	8.3	
Government Employees	12	15.2	12	15.3	
<b>Address</b>					
City	52	33.1	50	31.8	
Countryside	27	17.2	28	17.8	
<b>Gestational Age</b>					
Gestational Age (weeks)	39.14 ± 1.95		38.96 ± 1.57		0.242
<b>Baby's Birth Weight</b>					
Birth Weight (g)	3199.36 ± 586.48		3093.04 ± 623.56		0.335

**Table 2.** Characteristic Period, Blood Loss, Haemoglobin and Hematocrit Level

Characteristic	Oxytocin 10 IU	Oxytocin 20 IU	mean ± SD
<b>Period of the action of cesarean</b>			
Duration of action (minutes)	57.512 ± 5.5777	58.0506 ± 6.6850	0.184
Blood loss (mL)	475.51 ± 219.73	556.35 ± 330.37	0.56
The mean and the difference of haemoglobin level and hematocrit level			
Haemoglobin before cesarean section	10		.876 ± 1.389 10.631 ± 1.541 0.599
Haemoglobin after 24 hours	9		.737 ± 1.275 9.582 ± 1.345 0.746
Differences in haemoglobin level	1		.054 ± 1.052 1.136 ± 0.988 0.298
Hematocrit before cesarean section			
Hematocrit after 24 hour	33.53 ± 4,580	33.40 ± 4,87	0.532
Differences in haematocrit level	30,14 ± 4,030 3.28 ± 3.14	30.17 ± 4.22 3.35 ± 3.58	

In this study, the mean gestational age was 39.62 ± 0.948 weeks with the average age at oxytocin 10 IU group was 39.14 ± 1.95 weeks, and at oxytocin 20 IU group was 38.96 ± 1.57 weeks (p > 0.05). The youngest gestation was 28 weeks, and the oldest gestation was 43 weeks.

The mean of birth weight babies as a superficial mother that did the action of cesarean section in

both of the groups was 3145.86 ± 605.926 g. The lightest birth weight of babies was 1600 g, and the heaviest was 4800 g. In this study showed no significant differences of the mean of superficial birth weight of babies when the action of the cesarean section had done neither in oxytocin 10 IU 3199.36 ± 586.48 g nor oxytocin 20 IU 3093.04 ± 623.56 g (p > 0.05).

**Table 3.** The Characteristics of Reproductive, Intrapartum, Indication C-section and Additional Uterotonic, Side Effect and Risk Factors.

Characteristic	Oxytocin 10 U (%)	Oxytocin 20 U* (%)	P-value (%)
<b>Reproductive Status</b>			
Nullipara	31 (39.7)	27 (34.2)	58 (36.9)
Multipara	43 (55.1)	49 (62.0)	92 (58.6)
Grandmultipara	4 (5.1)	3 (3.8)	7 (4.5)
<b>Intrapartum Characteristics</b>			
MgSO <sub>4</sub> Intrapartum Oxytocin	14 (17.7)	11 (14.1)	0.664
Without Oxytocin	60 (75.9)	55 (70.5)	0.589
Induction	2 (2.5)	5 (6.4)	0.276
Acceleration	17 (21.5)	18 (23.1)	0.702
Chorioamnitis	7 (8.9)	8 (10.3)	0.793
Another Median of Rupture Membrane	268.99 ± 455.37	300.90 ± 545.65	0.277
Others	5 (6.3)	4 (5.1)	9 (5.7)
<b>Indication C-section</b>			
CPD/FPD	15 (19.0)	12 (15.4)	27 (17.2)
Fetal distress	8 (10.1)	10 (12.8)	18 (11.5)
Transverse lie	4 (5.1)	8 (10.3)	12(7.6)
Neglected labour	32 (40.5)	26 (33.3)	58 (36.9)
Haemorrhage antepartum	15 (19.0)	18 (23.1)	33 (21.0)
Others	5 (6.3)	4 (5.1)	9 (5.7)
<b>The Use of Additional Uterotonic</b>			
Additional uterotonics	34 (21.70)	29 (18.50)	0.279
Oxytocin	28 (35.44)	22 (28.51)	0.351
Metilergometrin	7 (4.50)	10 (6.40)	0.453
Misoprostol	-	-	-
<b>Side Effects</b>			
Chills	8 (5.01)	13 (8.03)	0.250
Vomiting	4 (2.05)	5 (3.02)	0.746
Total	12 (15.19)	18 (23.08)	
<b>Risk Factors</b>			
Neglected labour	11 (47.80)	12 (52.20)	0.260
MgSO <sub>4</sub> intrapartum	7 (63.60)	4 (36.40)	0.930
Oxytocin intrapartum	19 (45.24)	23 (54.76)	0.278
Chorioamnionitis	8 (88.90)	1 (11.10)	0.001

\*Chi Square Oxytocin 20 U :  $P > 0.05$

The mean of blood loss between both of treatment groups found no significant differences, where oxytocin 10 IU group had  $475.51 \pm 219.73$  mL, and oxytocin 20 IU group had  $556.35 \pm 330.37$  mL ( $p > 0.05$ ) with the mean of blood loss between both of the groups were  $515.67 \pm 282.24$  mL.

The mean of haemoglobin level before the action of cesarean section was  $10.754 \pm 1.4669$  g% with the lowest level about 5.5 g% and the highest level 15.7 g%, while the mean of hematocrit level was  $33.46 \pm 4.714$  vol% with the lowest level of about 19 vol% and the highest level about 48 vol%.

In this study, the mean of haemoglobin level before the action of cesarean level, as well as 24 hours after the action, found no significant differences ( $p > 0.05$ ) with the difference in oxytocin 10 IU group was  $1,054 \pm 1.052$  g%, and the mean

of haemoglobin level was  $0.820 \pm 1.288$  g%. In the oxytocin 20 IU group, the differences were  $1.136 \pm 0.988$  g% with the mean of haemoglobin level  $0.912 \pm 1.361$  g%. The differences of hematocrit level in oxytocin 10 IU was  $3,28 \pm 3,14$  vol% with the mean of hematocrit level  $2.58 \pm 3.97$  vol% and in oxytocin 20 IU was  $3.35 \pm 3.58$  vol% with the mean of hematocrit level  $2.54 \pm 4.15$  vol%.

The number of parity in this study varied from respondents who have never given birth before (nullipara), multipara: 1-5 times and grandmultipara: 6 times or more. The results found no significant difference in mean parity of each group, which is  $1.37 \pm 1.85$  times on oxytocin 10 IU group and  $1.53 \pm 1.75$  times on oxytocin 20 IU group ( $p > 0.05$ ).

The characteristic of intrapartum between both treatment groups was similar, that was

the patient who received  $MgSO_4$ , oxytocin, the incident of chorioamnionitis and the duration of the membrane to be ruptured. This study found no significant differences in intrapartum characteristics between both treatment groups ( $p > 0.05$ ).

The most indication for the action of cesarean section was neglected labor 58 cases (36.9%) with 32 cases (40.5%) at oxytocin 10 IU group and 26 cases (33.3%) at oxytocin 20 IU group that was meant statistically found no significant differences between both of treated groups ( $p = 0.877$ ). Generally, statistical analysis found no significant differences between both of the groups against the indication of cesarean section ( $p > 0.05$ ).

Oxytocin is the preparation that often used as an additional uterotonics in this study, about 28 cases (35.44%) for oxytocin 10 IU and 22 cases (28.21%) for oxytocin 20 IU, followed by addition of methergine about 7 cases (4.5%) compared to 10 cases (6.4%) in each treatment groups. From statistically analysis found no significant differences between both treatment groups against the use of additional uterotonics ( $p > 0.05$ ).

The use of additional uterotonics during the action of cesarean section is an action that given by an operator to avoid the uterine atony on patients in action so that the more of blood loss could be prevented because the operator could immediately assess and diagnose the contraction from uterine.

This results showed that both of the groups were needed additional uterotonics, so that found no significant differences in both of them ( $p = 0.260$ ). In cases that were used  $MgSO_4$  intrapartum, from 25 cases about 11 cases of it (44%) need additional uterotonics with details, 7 cases (63.6%) got additional uterotonics in oxytocin 10 IU group and 4 cases (36.4%) in oxytocin 20 IU group. The result of statistical analysis showed that  $MgSO_4$  intrapartum is not the significant risk factor for uterine atony could happen ( $p = 0.93$ ).

Like wise the cases that got oxytocin intrapartum, either induction or acceleration, where from 42 cases that got oxytocin

intrapartum, about 19 cases (45.24%) with 17 cases (89.47%) of it accelerated at oxytocin 10 IU group and 23 cases (54.76%) with 18 cases (78.26%) of it accelerated at oxytocin 20 IU. It found no significant differences in risk factors for uterine atony on the cases that got oxytocin while intrapartum in both of treatment groups ( $p = 0.278$ ), that means, in fact, the both of treatment groups almost the same, they require an additional uterotonic.

The interesting in this study, the cases with clinical chorioamnionitis diagnosis that got treatment of oxytocin 10 IU had significant risk factors for occurrences the uterine atony, about 16 cases with chorioamnionitis, 8 cases (88.9%) in oxytocin 10 IU and 1 case (11.1%) in oxytocin 20 IU ( $p = 0.001$ ).

The changes of haemodynamics status assessed were: the changes of blood pressure systolic and diastolic, pulse, temperature and the changes in oxygen saturation before and after the action of the cesarean section. From statistical analysis found no significant differences between the mean of haemodynamics status of respondents in both treatment groups both before and after the action of cesarean section ( $p > 0.05$ ).

The side effects observed were allergy, diarrhoea, hypotension, chills, vomiting and others that might be caused by the use of oxytocin. In detail, the side effects that arose both treatment groups can be seen in the table below.

This study seems to reinforce the use of oxytocin preparation to prevent uterine atony in postpartum especially in the action of cesarean section, that commonly used in many countries because it is a safe drug and has no side effects on the heart if administered intravenously and continuously.

## DISCUSSION

Based on the statistical analysis, found no significant differences on the mean of age, that was  $29.42 \pm 5.938$  years old in both of the treatment groups, in oxytocin 10 IU as well as oxytocin 20 IU ( $p > 0.05$ ). Munn MB et al reported a mean of age of  $25 \pm 6$  years old for low doses

of oxytocin 10 IU group and  $25 \pm 6$  years old for high doses of oxytocin 80 U, meanwhile in who compared prostaglandin  $F_{2\alpha}$  with oxytocin 20 IU got the mean of age was about  $29.2 \pm 5.9$  years old for prostaglandin and  $30.5 \pm 3.8$  years old for oxytocin group. Both studies showed that they had no significant differences in the mean of ages; this result is the same as the result of this study.<sup>12,13</sup>

The number of parity in this study varied from respondents who never give birth (nullipara), multipara: 1 – 5 times and grand multipara: 6 times or more. A number of parity counted based on the history of labour ever experienced at gestational age above 22 weeks.<sup>2</sup> In this study the mean of parity in both of the treatment groups was  $1.45 \pm 1.795$  times with range 0 to 9 with the reproductive status of respondents mostly was multipara about 92 cases (58.6%) with 43 cases (55.1%) on oxytocin 10 IU group and 49 cases (62%) on oxytocin 20 IU group. This study found no significant differences at the mean of parity in each group, that was about  $1.37 \pm 1.85$  times on oxytocin 10 IU group and  $1.53 \pm 1.75$  times on oxytocin 20 IU group ( $p > 0.05$ ). The result had no differ much compared to results that obtained by Dansereau et al, who compared carbetocin ( $1.2 \pm 0.8$ ) with Oxytocin ( $1.2 \pm 0.9$ ) in the action of cesarean section.<sup>10</sup>

The mean of gestational age was  $39.62 \pm 0.948$  weeks, in oxytocin 10 IU group was about  $39.14 \pm 1.95$  weeks, and in oxytocin 20 IU was about  $38.96 \pm 1.57$  weeks. The youngest gestational age was 28 weeks, and the oldest was 43 weeks. From the result, the mean of gestational age between both treatment groups found no significant differences ( $p > 0.05$ ). The gestational age was  $37 \pm 4.3$  weeks in oxytocin with low doses group and  $37 \pm 4.9$  weeks in high doses group, while got the result that did not much difference in this study, that was  $38.4 \pm 0.9$  weeks in oxytocin 20 IU group and the comparison group was  $38.5 \pm 0.8$  weeks.<sup>12</sup>

The mean birth weight babies as superficial of mothers that had an action of cesarean section in both of the groups were  $3145.86 \pm 605.926$  g. In this study showed no significant differences of the mean of superficial birth weight babies in action of cesarean section are performed, either in oxytocin 10 IU group was about  $3199,36 \pm$

$586,48$  g or in oxytocin 20 IU group was  $3093.04 \pm 623.56$  g ( $p > 0.05$ ). The mean birth weight babies were  $3284 \pm 367$  g for oxytocin 20 IU group and about  $3139 \pm 461$  g for  $PGF_{2\alpha}$  group.<sup>12</sup>

The mean of cesarean section duration was about  $57.7834 \pm 6.1460$  minutes, treatment with dose oxytocin 10 IU group  $57.51228 \pm 5.5777$  minutes and oxytocin 20 IU group  $58.0506 \pm 6,6850$  minutes, with the range time of cesarean section between 45 to 75 minutes. From the statistical analysis found no significant differences between both of the treatment groups in duration of action ( $p > 0,05$ ). This duration is less with the mean of duration of action for each treatment groups was similar, that was  $52 \pm 16$  minutes on low dose and  $54 \pm 18$  minutes on high dose ( $p = 0.53$ ) and got the mean was about 45,1 minutes in 20 IU group and 47.5 minutes in the comparison groups.<sup>12,13</sup>

The indication to perform an emergency action of cesarean section include DKP or FPD, fetal distress, HAP (placenta previa and placental abruption), neglected labour and abnormalities position of babies as well as other indications such as a history of cesarean section twice as much as 8 cases, each treatment group were 4 cases and six years of primary infertility was 1 case in oxytocin 10 IU group. The indications that the most took an action of cesarean section were neglected labour about 58 cases (36.9%) with 32 cases (40.5%) in oxytocin 10 IU group and 26 cases (33.3%) in the oxytocin 20 IU group, which means in statistical analysis found no significant differences between both treatment groups ( $p = 0,877$ ). The result was the same as that obtained where the most indication of cesarean section caused by neglected labor, was 41% for oxytocin with low dose and 34% for another ( $p = 0,16$ ) and different with the result that obtained where the most indication was the former of cesarean section about 66.67% in oxytocin 20 IU group and 50% in the comparison group.<sup>12,13</sup>

The Intrapartum characteristics of both treatment groups are almost the same. No significant differences for intrapartum characteristics between both treatment groups ( $p > 0.05$ ). This result was the same, but this study did not have amnioinfusion characteristics as they had obtained as 19% for a low dose of oxytocin and 23% for high dose because this procedure

was not the routine procedure that held in this department.<sup>13</sup>

The mean of blood loss between both treatment groups found no significant differences, with the mean of blood loss between both of the groups was  $515.67 \pm 282.24$  mL ( $p > 0.05$ ). This result was the same although the mean of bleeding between both of treatment groups in this study was less than they have obtained, that was about  $957 \pm 148$  mL in oxytocin with a low dose and  $937 \pm 159$  mL ( $p = 0.08$ ). The haemoglobin and hematocrit level was the critical variable to assess the blood loss in this study. In this study, obtained the mean of haemoglobin level before the action of cesarean section was  $10.754 \pm 1.4669$  g% with the lowest 5.5 g% and the highest 15.7 g%, while the mean of hematocrit level was  $33.46 \pm 4.714$  vol%, with the lowest was 19 vol% and the highest was 48 vol%. In this study, the mean of haemoglobin level before the action of cesarean section and 24 hours after the action of cesarean section showed no significant differences ( $p > 0.05$ ).

Haemoglobin and hematocrit level in statistically had no significant differences showed that the influence of haemoglobin and hematocrit level as a causal factor to success and failure in preventing of bleeding in the cesarean section could be ignored in both of the groups in this study. In this study, the mean of blood loss and decreasing hematocrit level found no differences between both treatment groups. It was predicted because uterine atony is easily diagnosed and treated at the time the action of the cesarean section took place because the uterus was exposed and more easily evaluated than vaginal deliveries. This situation will facilitate the introduction, and prompt treatment with the use of additional uterotonic thus would reduce the blood loss more.

Reduction, the amount of blood loss during the action of the cesarean section, was beneficial for patients that could reduce morbidity and the need for blood transfusion after the action. Although an accurate determination of blood loss required at the time of surgery, it was very challenging to do, especially inaction of the cesarean section because of the influence of the amniotic fluid and meconium. Blood loss less than 500 mL during the action of the caesarean

section could still be considered the accurate, but if more of it would be difficult to estimate the blood loss.<sup>10</sup>This study realized the difficulties, but the double-blind, randomized clinical trial has reduced bias in assessing blood loss and this study also compared the change in haemoglobin and hematocrit level.

Oxytocin is a preparation that is often used as an additional uterotonic in this study, based on the statistical analysis found no significant difference between both of the treatment groups against the use of additional uterotonic ( $p > 0.05$ ). These results differ from previous studies obtained which is as much as 39% in small doses of oxytocin 10 IU versus 19% on large doses of 80 U ( $p < 0.01$ , RR 2.1 95% CI, .4, 3).<sup>13</sup>

More widespread use of oxytocin as an additional uterotonic in this study, when compared to other types of uterotonic, seems to correspond with the function of oxytocin as first-line preparation to prevent postpartum haemorrhage. The absence of the addition of misoprostol during surgery, this might be related to the way of this preparation was less practical during the action of the cesarean section. There were 4 cases the addition of methergine as a second line of uterotonic after adding oxytocin to prevent the persistent uterine atony. There was no discontinuation solution case study because of complications during the action of the cesarean section. More on this study, obtained in recovering rooms the additional uterotonic each oxytocin 10 IU group: methergine. These results indicated that the need for additional uterotonic in recovering room between both treatment groups was not much different. In this study, changes in hemodynamic status were assessed include changes in systolic and diastolic blood pressure, pulse, temperature and the changes in oxygen saturation before and after cesarean section. From a statistical analysis showed no significant difference between the mean haemodynamic status of respondents between both treatment groups before and after the action of cesarean section ( $p > 0.05$ ).

Obtained the minimal side effects, so there was no termination solution for the study due to side effects. Hypotension and water intoxication were often feared the clinicians due to the use of oxytocin in this study was not found. There

were no significant differences between the side effects that arise (chills and vomiting) in both of treatment groups ( $p > 0.05$ ), although the incidence of adverse events was slightly higher in the group of 20 IU (23.08%) compared to the group of 10 IU (15.19%). From this research seems to reinforce the use of preparations of oxytocin to prevent postpartum uterine atony at cesarean section, especially when the action that has been widely used in many countries as it is a safe drug and has no side effects on the heart when administered intravenously and continuously. This drug has been recommended in various studies and writings with its use as an isotonic solution simultaneously antidiuretic effect and the possibility of hyponatremia.

In this study, patients who experience such disruption labour progress were required the additional uterotonic at oxytocin 10 IU group (47.8%) and in oxytocin 20 IU group (52.2%). The results indicate both of groups is almost the same that was need additional uterotonic preparation so that there were no significant differences between both treatment groups ( $p = 0,260$ ). These results differ from the study those obtained in which the ratio of 41% was obtained at 10 IU oxytocin group and 22% in the comparison group ( $p = 0,001$ ). In cases with the use of intrapartum  $MgSO_4$ , 44,00% of them required an additional uterotonic at oxytocin 10 IU group (63,60%) and the oxytocin 20 IU group (36,40%). From the statistical analysis, it turned  $MgSO_4$  intrapartum was not a significant risk factor for the occurrence of uterine atony, ( $p = 0,93$ ). These results were the same as those obtained which was 32% versus 29% ( $p = 0,57$ ).<sup>13</sup>

Likewise with cases that got intrapartum oxytocin, either induction or acceleration. There were no significant differences in risk factors for the occurrence of uterine atony in cases that got oxytocin when intrapartum in both of treatment groups ( $p = 0.278$ ) in the sense that almost the same both of treatment groups required additional uterotonic. The interesting thing about this study, it turns out the cases with a diagnosis of clinical chorioamnionitis who received treatment oxytocin 10 IU proved to have a significant risk factor for the occurrence of uterine atony, as much as 88.9% and 11.1% in the group treated with oxytocin 20 IU ( $p = 0.001$ ). These results were obtained from studies in which a low dose

of 10 IU treatment was more need for additional uterotonic in emergency action of cesarean section when compared with high-dose oxytocin (50% versus 24% with  $p > 0.001$ ).<sup>13</sup>

## CONCLUSION

Referring to the results of this study, which is not found significant differences between the use of oxytocin 10 IU and 20 IU as prophylactic of uterine atony on the actions of cesarean section either at the time the action caesarean section as well as in the recovery room, especially in cases without chorioamnionitis, then the use of regimen oxytocin 10 IU could be considered, in addition to its effectiveness did not differ, the cost of which will be paid half cheaper when compared to the regimen of 20 IU which has been frequently used. The results of this study ultimately expected to be a recommendation on the use of oxytocin as prophylaxis of uterine atony during cesarean section in obstetric practice every day.

The use of uterotonic preparations should still be used to prevent uterine atony and reduced bleeding during cesarean section. Oxytocin regimen of 10 IU can be considered to be the first line as prophylaxis for uterine atony during cesarean section, especially in those without chorioamnionitis.

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