Role of Doctors, Midwives and Nurses in Oxytocin Administration

Nurdan Demirci, Özlem Gürkan, Hediye Arslan, Zübeyde Ekşi

School of Nursing, Marmara University, İstanbul

Abstract

Objective: In order to evaluate oxytocin administration and determine the difficulties encountered by doctors, nurses and midwives.

Methods: 53 midwives and nurses and 25 doctors who accepted to participate were included in the study. Questions about the difficulties of oxytocin administration and solution suggestions for these difficulties were adressed and acquired data was evaluated quantatively and qualitatively.

Findings: 84.9% of midwives and nurses 76% of doctors have experienced difficulties during oxytocin administration. There are difficulties of oxytocin administration because of uncooperative patients, lack systematic of monitoring, sufficient equipment and an oxytocin protocol.

Result: Difficulties encountered during oxytocin administration can be decreased by using oxytocin protocols.

Keywords: Oxytocine usage, role of health professional.

Oksitosin uygulamalarında hekim, ebe ve hemşirelerin rolü

Amaç: Doğumhanelerde çalışan hekim, ebe ve hemşirelerin oksitosin uygulamalarını değerlendirmek ve uygulama sırasında karşılaştıkları güçlükleri belirlemek amacıyla tanımlayıcı olarak yapılmıştır.

Yöntem: Hastanelerin doğumhanelerinde çalışan ve araştırmaya katılmayı kabul eden 53 ebe ve hemşire ile 25 hekim çalışma kapsamına alınmıştır. Ebe, hemşire ve hekimlere oksitosin kullanımı, kullanım sırasında karşılaştıkları sorunlar ve çözüm önerileri ile ilgili sorular sorulmuş, elde edilen veriler yüzdelik ve kalitatif olarak değerlendirilmiştir

Bulgular: Oksitosin uygulaması sırasında ebe ve hemşirelerin %84.9'u, hekimlerin %76'sı güçlük yaşamaktadır. Yaşanan güçlükler; hastaların tedaviye uyumsuzluğu, takipteki aksamalar, malzeme eksikliği ve oksitosin protokolünün bulunmamasından kaynaklanmaktadır.

Sonuç: Oksitosin uygulaması sırasında karşılaşılan güçlükler, oksitosin protokolü kullanımı ile azaltılabilir niteliktedir.

Anahtar Sözcükler: Oksitosin kullanımı, sağlık personelinin rolü.

Introduction

Synthetic oxytocin which is a medicine approved by FDA (Food and Drug Administration) is commonly used in our country and the world. Usage frequency of oxytocin which is used with the aim of preventing parturition induction, therapeutic aborts, postpartum bleeding and providing postpartum lactation is increasingly raising nowadays.[1-7]

Correspondence: Özlem Can, Marmara Üniversitesi Haydarpaşa Kampüsü, Hemşirelik Yüksekokulu, Tıbbiye Cad. No: 49 Üsküdar 81326 İstanbul, e-mail: ozlemcan@marmara.edu.tr

While it is declared than oxytocin was used in 708.151 parturitions (18.4% of all parturitions) in United States this rate was stated as 20% in 2000.[1,8]

Although there is no data about oxycotin usage in obstetric clinics in our country, it is known that it is commonly used for induction of parturition. In cases pregnancy is required to be ended (due to pregnancy-based hypertension, early membrane rupture, chorioamnionitis, abnormal pregnancy tests (anencephaly, chromosome anomalies etc), intrauterine growth retardation, Rh incompatibility, over termination, diabetes in mother, kidney disease, chronic obstructive lung diseases and heart disease) oxytocin usage is recommended in a pregnant in/over its termination in order to start parturition pains or to increase insufficient pains.[4,9,11,12,17]

Attentive evaluation of patient and fetus before usage and attentive monitoring of mother and fetus during usage are essential in order to prevent possible complications. Inattentive usage of oxytocin may cause damage in mother and baby.[2,4,11,12]

Start of treatment should be decided after preconditions required for the application are provided. In recent years there are 2 treatment protocols recognized by ACOG (American College of Obstetricians and Gynecologists) relating to initial and improved doses of oxytocin. ACOG explained low and high dose treatment protocols in November 1999 bulletin (Table 1).[8] ACOG recommends oxytocin treatment to be prepared by adding 10 units of oxytocin in 1000cc isotonic liquid. oxytocin has some adverse effects like hyperstimulation (regardless of there is disruption in fetal heart rate), ablatio placentae, disruption in uterus blood stream, rapid parturition activity, uterus rupture, hyponatremia and postpartum bleeding which threat the health of mother and some other like fetal hypoxia, hiperbilirubinemia, fetal trauma and fetal death as a result of rapid parturition activity which affect the health of fetus. In addition, oxytocin may lead to liquid intoxication by making a weak antidiuretic hormone effect. Symptoms of liquid intoxication are lethargy, headache and defect of eyesight. A severe liquid intoxication may lead to death due to convulsions, coma and cerebral edema.[1,3-5,7,8,10,13,16]

With the aim of preventing liquid intoxication ACOG has emphasized that oxytocin should be taken in isotonic solution.[1]

In order to prevent complications which may affect both mother's and fetus' health during oxytocin administration doctors, midwives and nurses should behave attentively.

Midwives and nurses are responsible from preparation of IV (Intra Venous) solution, evaluation of patient before and during the application in terms of counter indications, and evaluation of responses of uterus and fetus to treatment.[11-15]

The purpose of our study is to determine the roles of doctors, midwives and nurses working in state and SSK hospitals placed in Istanbul and in which number of parturitions are so high in and the difficulties they encountered during oxytocin administration.

Methods

7 research and application hospitals dependent on Ministry of Health and monthly parturition

Table 1. Induction of parturition with oxytocin: low and high dose treatment protocol (form of oxytocin administration) (recommended by ACOG).

Treatment	Initial dose mÜ/dk	Agreed increase in dose (mÜ/dk)	Dose increase intervals (dk)
Low dose	0.5-1	1	30-40
	1-2	2	15
High dose	~6	~6	15
	6	6*, 3,1	20-40

*: This amount is decreased to 3 mU/min in case of hyperstimulation and to 1 mU/min if hyperstimulation repast.

number of which is over 100 were taken within the context of the study. The research was performed in obstetric clinics of the hospitals descriptively between 1 and 15 January 2004.

All midwives, nurses and doctors working in obstetric units of the hospitals constituted the universe of the research. 95 midwives and nurses and 55 doctors changing with shifts or rotations (who were in rotation during the research) serve in obstetric units of the hospitals. 53 midviwes-nurses and 25 doctors were taken in sampling group of the research.

Data were obtained by using question forms prepared by the researcher differently for midwives, nurses and doctors.

In question for prepared for midwives, nurses; questions including what they do before applying oxytocin treatment, their roles during the application of treatment, effects of the treatment, problems encountered during oxytocin application and solution recommendations for these problems were present.

In question form prepared for doctors their criteria to start oxytocin treatment, problems they encountered about oxytocin administration and solution recommendations, their expectations from midwives and nurses during oxytocin administration.

Question forms prepared by midwives, nurses and doctors were filled by the individuals through mutual interview techniques.

Obtained data were evaluated as percentage and qualitative.

Results

It was determined that different oxytocin applications are performed in hospitals we have included within the context of the research and any of which does not have a oxytocin treatment protocol written and approved by the institution.

20% among 25 doctors included within the study was specialist and 80% of which was general practitioner. When we examine the working periods of doctors in obstetric clinics it was 31.9 ± 37.1 month in average.

11.3% among 53 midwives and nurses within the study was nurse and 8.1% was midwife and 7.5% was officer midwife.

64.2% of midwives and nurses graduated from two-year degree and 26.4% from health vocational high school and 9.4% has graduate degree and their working period was 6.6 ± 6.6 year in average.

All doctors have stated that they start oxytocin treatment in order to activate obstetric pains and in case parturition activity is definitely required to be started (intrauterine growth retardation, intrauterine fetal death, early membrane rupture, oligohydroamnios etc.) if condition of fetus is good and Bishop score is appropriate (Table 2).

When we ask about adverse effects of oxytocin 94.3% of midwives and nurses answered as disruption in fetal heart rate, 73.6% answered as uterus hyperstimulation, 47.2% answered as nausea-vomiting, 39.6% answered as fetal- maternal tachycardia and 1.9% answered as decrease in urine amount (Table 3).

On the other hand it was determined that 16.1% among midwives and nurses have evaluated some adverse effects not resulted from oxytocin as if they resulted from oxytocin.

When distribution among attempts of midwives and nurses before oxytocin application, it was

Table 2. Distribution of criteria of doctors to start oxytocin treatment.

Criteria to start oxytocin treatment	n*	%
• In order to activate insufficient pains in parturition if the condition of fetus is normal and Bishop score is at least 5	25	100
• In case parturition activity is required to be started	25	100
• To accelerate parturition activity in normal progress	4	16
• Atonia bleedings	4	16

***:** n is multiplied since multiple answer was given

Table 3. Distribution of views of midwives and nurses about adverse effects of oxytocin.

Adverse effects of oxytocin	n*	%
• Disruption in fetal heart rate	50	94.3
• Hyperstimulatşon of uterus	39	73.6
• Nausea / vomiting	25	47.2
• Tachycardia (fetal / maternal)	21	39.6
• Headache	4	7.5
• Defect cardiac rate	4	7.5
• Respiration defect	2	3.8
• Decrease in urine amount	1	1.9
• Confusion	1	1.9
• Cases which are not adverse effects of oxytocin	8	16.1

***:** n is multiplied since multiple answer was given

determined that such a high percentage like 86.8% declared that patient is informed, 71.7% declared that vital findings are checked, 77.4% declared that NST application is performed (not stating a period), 67.9% declared that FHS (fetal heart sound) is checked, and such a low percentage like 26.4% declared that Leopold maneuvers are applied (Table 4).

Table 4. Distribution of initiatives of midwives and nurses before oxytocin application.

Applications	n (53)	%
Whether patient is informed		
• Informed	46	86.8
• Not informed	7	13.2
Vital symptoms		
• Checked	38	71.7
• Not checked	15	28.3
NST (Non Stress Test)		
• Applied	41	77.4
• Not applied	12	22.6
FHS evaluation		
• Applied	36	67.9
• Not applied	17	32.1
Vaginal examination		
• Applied	31	58.5
• Not applied	22	41.5
Anamnesis check		
• Checked	25	47.2
• Not checked	28	52.8
Leopold examination		
• Applied	14	26.4
• Not applied	39	73.6

Table 5. Distribution of follow-ups and frequency of these follow-ups performed by midwives and nurse during oxycotin application.

Applications	n (53)	%
Follow-up with fetal monitoring		
• Performed regularly (continually)	20	37.7
• Performed irregularly	14	26.4
• No answer	15	28.3
• Not performed	4	7.5
FHS follow-up		
• Regularly (in every 15 minute)	25	47.2
• Not regularly	17	32.1
• No answer	11	20.8
Vaginal examination		
• Regularly (in every one hour)	23	43.3
• Not regularly	14	26.4
• No answer	13	24.5
• Not examined	3	5.7
Follow-up contraction		
• Regularly (in every 15 minute)	13	24.5
• Not regularly	19	35.8
• No answer	17	32.1
• Not followed-up	4	7.5
Amniotic fluid amount, color and density		
• Regularly (in every one hour)	18	34
• Not regularly	12	22.6
• No answer	17	32.1
• Not examined	7	11.3
Blood pressure of patient		
• Regularly (in every half an hour)	29	54.7
• Not regularly	17	32.1
• No answer	7	13.2
Pulse rate of patient		
• Regularly (in every half an hour)	17	32.1
• Not regularly	25	47.2
• Not examined	11	20.8
Respiration of patient		
• Regularly (in every half an hour)	12	22.6
• Not regularly	13	24.5
• Not examined	28	60.4
Food inlet and vomiting		
• Regularly (in every one hour)	1	1.9
• Not regularly	12	22.6
• Regular in patients with preeclampsia	8	15.1
• No answer	23	43.4
• Not examined	9	17
Control of infusion dose		
• Regularly (in every half an hour)	21	39.6
• Not regularly	32	60.4
Control of any obstruction in set if exist		
• Regularly (in every half an hour)	18	34
• Not regularly	35	77.1

***:** Sources we have referred for follow-up frequencies (1,4,5,9,12,14,15,16,17).

When the follow-ups performed by midwives and nurses and their frequencies are examined in Table 5 it was determined that blood pressure of patient is followed-up regularly in a percentage of 54.7%, regular vaginal examination is performed in 43.3%, regular FHS check is performed in 47.2%

(in every hour in latent phase, in every 15-30 minutes in active phase), and the color and density of amniotic fluid is evaluated regularly in 34%.

Moreover, it is determined that pulse rate of patient in 47.2%, respiration in 24.5%, food inlet and vomiting in 22.6%, control of infusion dose in 60.4%, check of obstruction in set in 66.1% are followed up not regularly.

When we examined difficulties encountered by midwives, nurses and doctors relating to oxytocin application (Table 6); 56.6% percent of midwives and nurses and 48% of doctors stated that they encounter difficulty due to incompatibility of patient with treatment (patient may try to remove prenatal applied oxytocin by reason of pain, speed up of flow for medicine application to be completed early, rejection of patient to treatment etc.), and the rate of difficulties encountered resulted from trouble in follow-ups because of insufficient number of midwives and nurses are 39.6% in midwives and nurse and 28% in doctors.

It was also determined that insufficient number of fetal monitor was indicated as a reason by such a high percentage of doctors like 56% and by 18.9% of midwives and nurses.

Doctors, and midwives and nurses encounter difficulty due to the lack of oxytocin treatment protocol in such a low rates in respectively 12% and 11.3%.

When we examined the recommendations of midwives, nurses and doctors with the aim of removing difficulties encountered about oxytocin application, it was determined that 28 midwives/nurses and 2 doctors have no recommendation. When recommendations of midwives, nurses and doctors who made a recommendation 52% of midwives and nurses and 56.5% of doctors stated that the difficulties can be removed by increasing the number of materials (monitor, dose-flow, pump etc.) and through preparation of an oxytocin treatment protocol (8% of midwives and nurses and 8.6% of doctors) (Table 7 and 8).

While 52% of midwives and nurses think that the difficulties can be decreased by follow-up of pregnant women in pain clinic more regularly, 95.6% of doctors stated that the difficulties can be removed by follow up of pregnant women in pain clinic by midwives and nurses more regularly and 17.3% stated difficulties can be removed by increasing the number of midwives and nurses to work effectively in obstetric clinics.

When we examined the expectations of midwives and nurses from doctors relating to oxytocin application; 45.4% stated that doctors should be attentive and not behave impatiently while selecting patients, 27.2% stated preparation of oxytocin treatment protocol and performing dose arrangements by using this treatment protocol and 18% stated that doctors should write a formal request. It was also stated that 24 nurses among 53 do not have any expectation (Table 9).

While 39% of doctors expected from midwives and nurses to follow-up dropping speed and patients regularly, only 9% stated that midwives and nurses do not have enough information about oxytocin treatment (Table 10).

Discussion

Doctors, midwives and nurses should firstly evaluate the patient while using oxytocin and

Table 6. Distribution of difficulties encountered by midwives and nurses and doctors.

Problems	Midwives and nurses		Doctors	
	n* (53)	%	n* (25)	%
• Incompatibility of patients to treatment	30	56.6	12	48
• Troubles in follow-ups due to insufficient number of midwives and nurses	21	39.6	7	28
• Insufficiency in fetal monitor	10	18.9	14	56
• Communication gap between midwives and nurses and doctors	11	20.8	5	20
• Lack of oxytocin treatment protocol	6	11.3	3	12
• Not any problem encountered	8	15.1	6	24

*: n is multiplied since multiple answer was given

Table 7. Recommendations of midwives and nurses relating to difficulties encountered in oxytocin application.

Recommendations	n* (25)	%
• Increase in the nube rof materials (monitor, dose-flow, pump etc.) (monitör, doziflow, pumb v.b)	13	52
• More regular follow-up of patients	13	52
• Attention of doctors in treatment	8	32
• Development of a protocol	2	8

*: n is multiplied since multiple answer was given, only those who has a recommendation (n=25) was evaluated.

Table 8. Recommendations of doctors relating to difficulties encountered in oxytocin application.

Recommendations	n* (23)	%
• Careful follow-up of oxytocin dropping speed	9	39
• Regular follow-up of patient applied oxytocin treatment	9	39
• Attentive follow-up whether or not vessel way is open	5	21.7
• Provision of fetal monitoring and capacity of interpreting NST	4	17.3
• Follow-up of complications to appear during oxytocin application and informing patient about them	4	17.3
• Ensuring midwives and nurses have sufficient information about oxytocin treatment	2	9

*: n is multiplied since multiple answer was given, only those who has a recommendation (n=23) was evaluated.

Table 9. Expectations of midwives and nurses from doctors Expectations.

Expectations	n* (22)	%
• Doctors should be attentive while selecting patients and should not behave impatiently	10	45.4
• Development of an oxytocin treatment protocol and performing dose arrangement by using this protocol	6	27.2
• Writing order	4	18
• Doctors should not leave oxytocin application time to late hours as far as possible	3	13.6

*: n is multiplied since multiple answer was given, only those who has a recommendation (n=22) was evaluated.

should inform patient about effects and adverse effects of the treatment.[7]

Before the application Bishop scoring is required to be evaluated and obtained value should be at least 4, fetal lung maturation should be ensured, pregnancy week should be appropriate, situation of mother should be stable, size and location of fetus should be appropriate.[2,4] If Bishop

Table 10. Expectation of doctors from midwives and nurses.

Expectations	n* (22)	%
• Doctors should be attentive while selecting patients and should not behave impatiently	10	45.4
• Development of an oxytocin treatment protocol and performing dose arrangement by using this protocol	6	27.2
• Writing order	4	18
• Doctors should not leave oxytocin application time to late hours as far as possible	3	13.6

*: n is multiplied since multiple answer was given, only those who has a recommendation (n=22) was evaluated.

score is less than 4, possibility of failure in induction is higher.[4,7]

Sometimes oxytocin treatment may be started regardless of fetal maturity in situation which threat mother's life.[2,7]

When we examined criteria of doctors to start oxytocin treatment in our research; it was determined that all doctors use oxytocin in order to activate insufficient pains in the parturition when parturition activity is definitely required to be started and Bishop score is 5 and more in accordance with the literature.[7]

However another usage we obtained in our study and which is not appropriate with the literature is using oxytocin in order to gain time by accelerating a parturition activity in its normal progress. 16% of doctors use oxytocin with the aim of accelerating a parturition activity in its normal progress. It can be considered that this usage is resulted from excess number of patients in obstetric clinics and the aim of preventing patient accumulation however it is not a desirable method.

Oxytocin has some adverse effects both in terms of mother and baby.[7] Midwives and nurses are considerably important in terms of being informed about adverse effects of oxytocin and early notification of adverse effects.[9] It should be remembered that the person who follow-up mother and fetus closely and who notice differences to occur is midwives and nurses.

It was determined in our study that a big majority of midwives and nurses are aware of common adverse effects of oxytocin like defect in fetal heart speed and uterus hyperstimulation but not aware the adverse effect of liquid intoxication (decrease

in urine amount, headache and defect I heart rate etc.) which is rarely seen. It can be considered that information which midwives and nurses are caused by their earlier experiences.[12]

Midwives and nurses should make some explanations about the purpose, reason, of oxytocin treatment, problems which may appear during the treatment and some warnings the patient should give attention during the treatment in order to ensure the patient and her family to comply with the treatment before the application.[11,12] Most of midwives and nurses have declared they give some information for patients but did not explain context of information.

Evaluation of mother and baby by midwives and nurses is so important in order to learn existing problems and discover risky situations. Vaginal and abdominal evaluation of pregnant women taken anamnesis should be fulfilled. Position and presentation of the fetus should be evaluated with Leopold maneuvers abdominally applied. Vital symptoms of pregnant woman should be recorded and fetus heart speed should be listened. If there is a counter indicated situation to start oxytocin a doctor should be notified.[4,11,12]

In the study performed by Goetzl et al it was determined that patients who experienced uterus rupture before are more possible to experience uterus hyperstimulation. For this reason oxytocin should not be applied or applied with an attentive follow-up in a patient who has a rupture history.[13]

In our study it was determined that a big majority of midwives and nurses check vital symptoms of patients before the treatment and evaluate the situation of baby with fetal monitor.[4,7,11,12,17] However, the rates of midwives and nurses who evaluate situs and habitus of the baby by applying vaginal examination, anamnesis check and Leopold maneuvers are low. We can say that these rates are such low since midwives and nurses are not given a responsibility and everything is under responsibility of doctors.

Fetal heart speed and contractions are continuously followed-up with electronic fetal monitor during the regular oxytocin application and in case of divergence from normal speed of fetal heart infusion should be urgently turned off.[4,7,11,12,17]

The rate of follow-up with fetal monitor is founded as low in our research due to the insufficient number of fetal monitor and midwives, nurses and doctors also stated fetal monitor shortfall as a problem.

In this case result from insufficient fetal monitors midwives and nurses may notice complications to appear in advance by frequently following-up FHS with manual Doppler or fetoskope and applying contraction check in every 10 minutes according to the stage of travail. However, it cannot be said in our study that FHS follow-ups are performed in phases determined in the literature (in every hour in latent phase and in every 15-30 minutes in active phase) and regularly.[4,11,12,16]

Although midwives and nurses mostly know defect in heart speed and hyperstimulation as adverse effects of oxytocin it is thought provoking that regular follow-up rates are low. Lowness of regular FHS and contraction follow-up rates may be related with the situation in some clinics where this responsibility is conferred to doctor and with insufficient number of midwives and nurses.

The earliest forerunner of liquid intoxication, uteri rupture and ablatio placentae to happen during oxytocin application is defect in woman's vital findings and in FHS and decrease in urine outlet. For this reason, nurses are required to perform these follow-ups with regular intervals. Moreover another early symptom of liquid intoxication is defect in heart rate and heart of the patient should be followed-up regularly.[4,9,11,12,14,15]

Even though more than half of midwives and nurses in our study stated that they perform regular blood pressure check, it was determined that they do not perform pulse check regularly in a high percentage and half of midwives and nurses never perform respiration check. However, blood pressure, pulse and respiration checks should be regularly performed.

It was also determined that follow up of food inlet and vomiting is almost never performed regularly in normal pregnant women. This situation may result from that midwives and nurses do not know liquid intoxication as an adverse affect to happen as a result of oxytocin usage and there are not present easily used scaled cups in toilets.

The amount, color and density of amniotic fluid should be checked and recorded.[4,9,11,12,16]

Oxytocin oscillates in human body in a rhythmic way by its nature.[6] In order to ensure IV applied oxytocin dose flows in a proper amount it should be regularly followed-up whether there is any obstruction or excess flow in the set. Excess flown oxytocin leads to uteri hyperstimulation and uterus rupture insufficient flow of oxytocin dose prevents expected effect to happen.[9,11,12,16]

It was determined in our study that midwives and nurses do not regularly check drop numbers obstructions in the set. Just like other follow-ups defects in this follow-up may be caused by insufficient number of nurses.

Patients who take oxytocin treatment should be regularly followed-up with electronic fetal monitor and infusion pumps should be used for oxytocin dose to be flown in proper amounts.[4,6,9,12,17] This justification can more easily explain why doctors encounter problems mostly caused by insufficient fetal monitor during oxytocin administration. Doctors, midwives and nurses have the common view that this difficulty can be removed by increasing the number of materials.

While doctors encounter problems mostly due to insufficient fetal monitor, midwives and nurses are in difficulty due to incompatibility of patients with the treatment (patient or her relatives may try to remove prenatal applied oxytocin by reason of pain, and speed up of flow for medicine application to be completed early). While most midwives and nurses in our study state that they inform patients before treatment, incompatibility of patients with the treatment indicates that provided information is insufficient.

While doctors recommend more regular follow-up of patients by midwives and nurses in order to remove problems encountered in oxytocin administration, midwives and nurses recommend in a similar way that doctors should follow up patients more regularly. This situation can be explained as there is a confusion relating to responsibility allocation between doctors and nurses during the follow-ups. If there were protocols in obstetric clinics which clearly indicate responsibilities of both doctors and midwives and nurses during oxytocin administration this confusion would be rarely encountered. However in our study only a small number of doctors and nurses have the view that problems can be diminished with the presence of a oxytocin treatment protocol.

Majority of the doctors expect from midwives and nurses to follow-up patients and dropping speed of oxytocin. As we determined in our study, problems resulted from irregular follow-up of oxytocin infusion speed and patients by midwives and nurses may lead doctors to state such an expectation.

On the other hand, midwives and nurses stated that they expect from the doctors to pay attention while selecting patients and not to behave impatiently.

In conclusion, it was determine din our study that some problems are experienced relating to oxytocin usage, and these problems by their nature can be prevented through preparation of a oxytocin treatment and follow-up protocol, material provision and training of patients. Oxytocin treatment and follow-up protocol should be in nature which clearly state how and in which doses the medicine will be used, how much dropping application should be started with, follow-ups and frequency of follow-ups required to be performed by midwives/nurses during the medicine application, emergency cases to be encountered during the medicine application and the roles of doctors midwives/nurses during the emergency cases.

Doctors, midwives and nurses should be in cooperation and the roles of each in the application should be determined in while preparing and applying a treatment and follow-up protocol. Institutions should remember that material deficiency in obstetric clinics may cause vital results and should attempt for provision of deficient materials. In addition, information should be provided for health personnel in hospitals relating to patient training methods.[5]

References

1. Ruchala PL, Metheny N, Essenpreis H, Borcherding K. Current practice in oxytocin dilution and fluid administration for induction of labor. *JOGNN* 2002; 31: 545-50.
2. Shyken JM, Petrie RH. The use of oxytocin. *Clinics in Perinatology* 1995; 22(4): 907-31.
3. Kayaalp O. Rasyonel Tedavi Yönünden Tıbbi Farmakoloji, 3. Cilt. Ankara, Feryal Matbaacılık, 1990.

4. Nichols F, Zwelling E. Maternal-Newborn Nursing Theory And Practice. Phiadelphia, Saunders Company, 1997.
5. Martin LL, Reeder SJ. Essentials Of Maternity Nursing: Family-Centered Care. Phiadelphia, Lippincott Company, 1991.
6. Willcourt RJ, Pager D, Wendel J, Hale RW. Induction of labor with pulsatile oxytocin by a computer-controlled pump. *Am J Obstet Gynecol* 1994; 170(2): 603-8.
7. Royal Collage of Obstetrians and Gynaecologist. Induction of labor. GUIDELINE. RCOG Press. London. (Guideline No: 9), 2001 Jun., 78 pages.
8. Stubbs TM. Oxytocin for labor induction. *Clinical Obstetrics and Gynecology* 2000; 43(3): 489-94.
9. May KA, Mahlmeister L R. Comprehensive Maternity Nursing. Phiadelphia, Lippincott Company, 1990.
10. Gagnon AJ, Waghorn K. One-to-one nurse labor support of nulliparous women stimulated with oxytocin. *JOGNN* 1999; 28(4): 371-6.
11. Mccarthy MC, Mullee M. Oxytocin induction augmentation of labor. In: Gulanick M, Gradishar D, Puzas M K (Ed). Obstetric And Gynecologic Nursing. Albany, Delmar Publishers; 1994.
12. Simpson KR. Creehan PA. Perinatal Nursing. Philadelphia, Lippincott Company, 1994.
13. Goetzl L, Shipp TD, Cohen A, Zelop CM, Repke JT, Lieberman E. Oxytocin dose and the risk of uterine rupture in trial of labor after ceserean. *Obstet Gynecol* 2001; 97(3): 381-4.
14. Clark AL, Affonso D. Childbearing: a Nursing Perspective Edition 2. Philadelphia, F.F. Davis Company, 1996.
15. Ladewing PW, London ML, Olds SB. Essentials of Maternal Newborn Nursing. California, A division of the benjamin / cummings publishing company, 1990.
16. Brodsky PL, Pelzar EM. Rationale for the revision of oxytocin administration protocols. *JOGNN* 1991; 20(6): 440-4.
17. Royal Collage of Obstetrians and Gynaecologist. The use of electronic fetal monitoring. GUIDELINE. RCOG Press. London. (Guideline No:8), 2001 May, 136 pages.