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ORIGINAL ARTICLE

Knowledge, Attitude and Practices on the Use of Uterine Tamponade in the Management of Severe Postpartum Hemorrhage in Public Health Facilities of Niger State.

Sheshi IM[1], Baba UA[2], Hadiza LM[3], Anna S[4], Yinti GM[5], Agbana BE[6]

[1] Health Research Unit, Niger State Ministry of Health, Minna
[2] Niger State Ministry of Health, Minna
[3] Niger State Ministry of Health, Minna
[4] Niger State Primary Healthcare Development Agency, Minna
[5] Jummai Babangida Maternal & Newborn Hospital, Minna
[6] Department of Community Health, College of Health Science, Kogi State University, Anyigba

Keywords

Knowledge;

Attitude;

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Tamponade.

ABSTRACT

Background: Obstetric hemorrhage is a contributor to worldwide maternal morbidity and mortality in low-resource countries. The aim of this study was to assess knowledge, attitude and practices on the use of uterine tamponade in managing severe postpartum hemorrhage (PPH) by healthcare personnel.

Method: The study was descriptive and cross-sectional. A self-administered, structured questionnaire was used to collect data on uterine tamponade from untrained and trained health workers who take deliveries in labour wards of selected health facilities. Respondents were selected by cluster sampling technique. Data was analyzed using SPSS version 20. Frequencies were determined and chi-square was used to test the hypothesis. A p-value of <0.05 was considered statistically significant.

Results. The mean age of the respondents was 35 years ± 11.7. Slightly less than half of the respondents 62 (42.5%) had poor knowledge of uterine tamponade. The majority of respondents 120 (82.2%) had positive attitudes about uterine tamponade. This was associated with point of service, professional group, and previous training on uterine tamponade insertion (p<0.05). About 70% (46; 69.7%) of respondents who had managed cases of refractory postpartum hemorrhage, had never conducted uterine tamponade. Reasons include inadequate knowledge (29; 63.0%) and unavailability of the commodities (9; 19.6%)

Conclusion: Though knowledge about uterine tamponade was poor, attitude towards uterine tamponade in managing severe post-partum hemorrhage was good. However, this did not translate to good practices on the use of uterine tamponade in managing severe PPH. Training and re-training on the application of uterine tamponade should be conducted and commodities made available in every health facility.

Correspondence to:
Idris Mohammed Sheshi
Health Research Unit,
Niger State Ministry of Health,
Email: idrissheshi15@gmail.com

INTRODUCTION

Pregnancy is a thing of joy, so no woman should die in the process of childbirth. Women who die from obstetric complications or after delivery leave behind children whose chances of survival are also reduced. This often results in, grave consequences on the growth and development of the children. "For every woman who dies because of pregnancy and related causes, a man is widowed, disoriented and devastated, her parents are denied their old age benefit".[1].

In the 2017, the global maternal mortality ratio was 211 per 100,000 live births, and in Nigeria, 917 deaths per 100,000 live births. This was over two third of all maternal deaths worldwide.2 The values are still high and above the Sustainable Development Goals' (SDG) recommended 70 per 100,000 live births by 2030.[3]

Obstetric hemorrhage is a significant contributor to worldwide maternal morbidity and mortality in low resource countries. Post-partum hemorrhage (PPH) accounted for 24% of maternal mortality and is Nigeria's leading cause of maternal mortality.[4,5]

Uterine atony is the most common cause of PPH and accounts for 79% of all postpartum hemorrhages.[4]

Uterine atony is a failure of the uterus to contract and retract following delivery which is vital to arrest bleeding.6. The uterus is soft and boggy in uterine atony, with the presence of excessive bleeding from the genital tract. The uterus remains relaxed and without tension after giving birth.[6]

Factors that may predispose to uterine atony include prolonged labor, very rapid over-distention or excessive enlargement of the uterus and misuse of Pitocin, Other risk factors, include, multiple pregnancies, fetal macrosomia, maternal age above 35years and obesity.[6] The management of uterine atony is well-known and based on international guidelines. First-line treatment includes immediate uterine massage and administration of uterotonic drugs. Also, artery ligations via laparotomy are the most common invasive procedures with high levels of fatality from surgery, and anesthesia, thus it is important to identify second-line procedures that are less invasive and better adaptable to low-resource settings.

Uterine balloon tamponade (UBT) is used for the management of uterine atony if bleeding is not responsive to pharmacological treatments. Uterine tamponade is a device inserted into the uterus to reduce postpartum hemorrhage. The term tamponade is derived from tampon, a French word that invariably means stopper inserted into an open wound.[7] In a study conducted at St. George Hospital London, the management of severe postpartum hemorrhage showed that 81% of the respondents had hemostasis achieved from uterine bleeding.8 In a randomized controlled study to assess the efficacy and safety of condom-loaded foley's catheter versus Bakri balloon, bleeding was controlled in both cases without significant difference. However, the Bakri balloon stopped the bleeding within a shorter period of 9.09 minutes versus 11.76 minutes.[9] In the year 2014, in Niger State, selected doctors, nurses, midwives and community health extension workers (CHEWs) were trained on life-saving skills, essential obstetric care and newborn care, including the use of uterine tamponade by a team from Liverpool School of Tropical Medicine (LSTM). There are limited studies in low and middle-income settings on uterine tamponade. Therefore, this study assessed the knowledge, attitude and level of practice on the use of uterine tamponade in the management of severe post-partum hemorrhage.

METHODOLOGY

Niger State is one of the states in North Central Nigeria consisting of 25 local government areas. It has 1,448 primary healthcare facilities, 23 secondary health facilities and 2 tertiary health facilities. About two hundred and fifty health workers from twenty health facilities comprising of primary and secondary healthcare facilities were trained on uterine tamponade in April 2014.

This descriptive cross-sectional study was conducted among healthcare workers in labour wards of the selected healthcare facilities where staff had been trained on uterine tamponade. Included in the study, were both untrained and trained staff on uterine tamponade insertion by the Liverpool School of Tropical Medicine. Staff who had gone on study or annual leave were excluded. The minimum sample size of 135 was determined by Fischer's formula for calculating sample size with the target population less than 10,000, taking into consideration of 50% prevalence of any characteristic under study.10 To compensate for non-response, assuming 9% non-response, the sample size was increased to 150.

Respondents were selected using cluster sampling technique. Healthcare facilities whose staff were trained on the use of uterine tamponade for post-partum hemorrhage were identified. Half (10 health facilities) of the identified facilities (both primary and secondary health facilities) were chosen through a simple random sampling technique by balloting. In the chosen facilities, the staff who manage deliveries (both trained and untrained) in the labour wards were recruited into the study.

Data was collected through a self-administered, structured questionnaire. The research tool was adapted from a previous qualitative study and a WHO recommendation guide.[11,12] The construct of the questionnaire was assessed by an expert and later pre-tested. Data collected were assessed for completeness, coded and entered into a computer. The data analysis was conducted using SPSS Software version 20. Knowledge score was categorized into poor, moderate

and good knowledge while attitude was also categorized into poor and good attitude. Statistical association between attitudinal score, knowledge grade as dependent variables and socio-demographic characteristics of the respondents as independent variables were determined by chi-square. The significance level was set at $p < 0.05$.

Ethical approval was obtained from Niger State Ministry of Health Research Ethical Committee (NSMOH ERC PAN/2022/08/014). Written informed consent was sought from the respective respondents before the administration of the questionnaires. The purpose of the research was also explained to the respondents. Confidentiality was assured with the liberty to opt out of the study if they were no more comfortable. The informed written consent form was duly signed by individual respondents.

RESULTS

One hundred and forty-six (146) respondents participated in the study. The mean age of the respondents was 35.5 years ± 11.7. The modal age group was 29-38 years of age 56(38.4%). Females 127(87.0%) constituted the majority of the respondents. Most of the respondents were Nurses or midwives (51;34.9%) in the professional groups, followed by Community health workers 44(30.1%). About two-thirds (90;61.6%) of the respondents were from secondary health facilities. About one-third (53;36.3%) of the respondents had more than 9 years of experience in child delivery. More than half of the respondents (78; 53.4%) were not trained on the use of Uterine Tamponade in the management of severe PPH. **(Table 1)**

Almost half of the respondents (70; 47.9%) had a fair knowledge of uterine tamponade, while about 10% (14; 9.6%) had good knowledge. **(Figure 1)**

Among the professional groups, about one-third of doctors (3; 30.0%) had good knowledge of uterine tamponade. This was statistically significant (*P*-value = 0.001). **(Table 2)**

Most of the respondents 127(87.0%) opined that they can refer cases of severe postpartum hemorrhage to have uterine tamponade insertion. More than half of the respondents disagreed 98(67.1%) that fertility cannot be preserved following the insertion of uterine tamponade. Over 90% of the respondents (135;92.5%) reported that uterine tamponade insertion can avert the need for surgical intervention in most cases of severe postpartum hemorrhage. Most of the respondents 122(83.6%) prefer insertion of uterine tamponade to surgical intervention while less than 1/10th of the respondents 11(7.5%) prefer surgical intervention to uterine tamponade insertion. More than half of the respondents 88(60.3%) disagreed that uterine tamponade insertion is always associated with complications. (Table 3)

Most of the respondents (120; 82.2%) had a good attitude while 26 (17.8%) respondents had a poor attitude. All the Doctors 10(100.0%) had a good attitude toward the management of severe postpartum hemorrhage with uterine tamponade. There was a statistical association between professional groups and attitude, p=0.015.

The majority (81; 89.9%) of the respondents from secondary health facilities had good attitudes about uterine tamponade in the management of severe post-partum hemorrhage. The relationship between point of service and attitude was statistically significant. (p=0.002). The study showed that most of the respondents trained on the uterine tamponade insertion had good attitudes (63; 92.6%) towards the use of uterine tamponade in managing severe post-partum hemorrhage. There was a statistically significant association between previous training of health care workers and attitudes on uterine tamponade. (p=0.002). **(Table 4)**

Out of the 66(45.2%) of respondents who had ever managed cases of refractory postpartum hemorrhage, about 70% (46; 69.7%) had never inserted uterine tamponade. **(Table 5)**

More than half (29;63.0%) of the respondents who had never participated in uterine tamponade insertion gave reasons such as inadequate knowledge (9; 19.6%) and unavailability of commodities required to carry out the procedure. **(Table 5)**

DISCUSSION

The mean age of the respondents was 35.5 years ± 11.7 and the modal age group was 29-38 years of age (38.4%). Most of the respondents (47.9%) had a fair knowledge of uterine tamponade while less than 1/10th of the respondents had good knowledge. This may be because the training was conducted about 8 years prior to the study and the training was not repeated to enhance their knowledge. Another possible reason is the possibility that the number of trained personnel had reduced due to migration, retirement and or death, impacting negatively on the knowledge score. However, more than half of the respondents had heard of the uterine tamponade procedure. This is in contrast to a study conducted in

the Niger Republic on a National initiative to reduce post-partum hemorrhage in phase 1 level of implementation which showed that less than half of the respondents had good knowledge of the procedure of uterine tamponade insertion and removal.[13]

This study has shown that medical doctors had the best knowledge scores while community health workers had poor knowledge scores. There was a statistically significant association between knowledge about uterine tamponade and professional groups (p=0.001). The reason may be a result of their training exposure. Perhaps they may have had previous knowledge of uterine tamponade during their medical training. At the primary healthcare facilities, most of the personnel are community health workers. With such poor knowledge scores among this category of health personnel, the practice of the use of uterine tamponade in managing cases of severe postpartum hemorrhage at the level of health facilities may also be suboptimal.
The majority of respondents had positive attitudes about the use of uterine tamponade in managing severe cases of postpartum hemorrhage. This is consistent with a study on provider's experience with the use of uterine tamponade in Dar Es Salam, though it was a qualitative study, all the respondents had positive attitudes towards the use of uterine tamponade.[11]

In this study, most of the respondents reported that the use of uterine tamponade can avert the need for surgical intervention. Qualitative studies on providers' experience and perceptions of uterine tamponade in various locations were in line with this assertion.[14,15,16] The respondents pointed out that the use of uterine tamponade reduced the requirements for surgical interventions which may result in complications. This is because of the safety, simplicity and cost-effectiveness in arresting postpartum hemorrhage which was corroborated by the study carried out by Finlayson et al, and in South Sudan.[14,17] The majority of the respondents in this study also attested to its simplicity, by disagreeing that it was a complex procedure. Most of the respondents disagreed, that, the use of uterine tamponade is usually associated with complications. This is in consistent with a systematic study carried out by Tindall and his colleagues which pointed out that in thirteen reviewed cases, uterine tamponade effectively controlled 97% of the cases (234 out of 241 cases) without significant complications.[18] This is because the procedure uses cheap technology which is readily accessible and low-skilled personnel can utilize tamponade in managing cases of severe postpartum hemorrhage.[18]

The majority of the respondents in this study pointed out that the commodities for uterine tamponade procedures are readily available. This is similar to a study carried out in Dar Es Salam on providers' perception of uterine tamponade, in which nearly half of the respondents said the commodities for uterine tamponade are always available.[11] Most of the respondents in this study claimed the practice of using uterine tamponade in arresting bleeding from postpartum hemorrhage refractory to the use of uterotonic agents was an exclusive function of senior colleagues although, less than half disagreed. This could contribute negatively in terms of coverage and adoption of uterine tamponade in primary healthcare facilities.

Most of the trained personnel and those from secondary health facilities had good attitudes regarding the use of uterine tamponade in managing cases of severe postpartum hemorrhage. This may be due to the training they had received on the importance of uterine tamponade in arresting bleeding from postpartum hemorrhage. This could explain why most cases of PPH are referred to higher levels of health facilities resulting in clogging of such health systems.

Most of the respondents who had managed cases of severe PPH, had never applied uterine tamponade. This is similar to a study conducted in the United States of America in which the majority who had previously managed uncontrolled PPH over the course of their career had never applied uterine tamponade. The major reasons given for non-application was inadequate knowledge about uterine tamponade insertion.[19] This also corroborates findings from the qualitative study conducted in Dar Es Salam on the perception and barriers to the use of uterine tamponade in managing cases of severe PPH which reported inadequate knowledge.[14] Another barrier identified in our study was the unavailability of necessary commodities required for the application of uterine tamponade. In a Guatemala study on the evaluation of simulation-based training for PPH management, healthcare workers were not practicing the use of uterine tamponade in managing cases of severe PPH on account of a lack of commodities.[20] The implication is that without the necessary commodities, knowledge gained during the training cannot be used. Thus, negatively impacting efforts to reduce maternal mortality.

LIMITATIONS OF THE STUDY

Data were collected using self-administered questionnaires and could have been prone to response bias. However, guidelines were provided on how to fill out the questionnaires. Respondents were told to fill out the questionnaire independently without

collaborating with one another and asked to submit it immediately after they completed the tool.

CONCLUSION

This study shows that most respondents had fair knowledge and less than 1/10th had good knowledge on the use of uterine tamponade to manage refractory postpartum hemorrhage. There was a significant association between knowledge about uterine tamponade and professional groups. The majority of respondents had a good attitude toward the process which was influenced by previous training, point of service, and professional groups. Most of the respondents, who had managed cases of severe postpartum hemorrhage, had never applied uterine tamponade. Reasons for this include inadequate knowledge and unavailability of the commodities.

Re-training of the health personnel on uterine tamponade in the management of severe post-partum hemorrhage should be conducted and cascaded to other health facilities in the state. Also, the state government should ensure the commodities for the application of uterine tamponade are readily available in every health facility and non-governmental organization (NGOs) in the state can provide the necessary support for this intervention.

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Table 1; Socio-demographic characteristics of the respondents

Variables	Frequency (n=146) n (%)
Age groups	
19 – 28	39 (26.7)
29 – 38	56 (38.4)
39 – 48	37 (25.3)
49 – 58	14 (9.6)
Mean ± SD	35 ± 11.7
Sex	
Male	19 (13.0)
Female	127 (87.0)
Professional group	
Doctor	10 (6.8)
Nurse	6 (4.1)
Nurse/Midwife	51 (34.9)
Midwife	35 (24.0)
Community health worker	44 (30.1)
Marital status	
Single	37 (25.3)
Married	106 (72.6)
Divorced	2 (1.4)
Widowed	1 (0.7)
Tribe	
Nupe	60 (41.1)
Gwari	22 (15.1)
Hausa	28 (19.2)
Igbo	7 (4.8)
Yoruba	13 (8.9)
Others	16 (11.0)
Point of service	
Primary facility	56 (38.4)
Secondary facility	90 (61.6)
Duration of experience in child delivery(years)	
< 4	48 (32.9)
5 – 9	45 (30.8)
> 9	53 (36.3)
Religion	
Islam	100 (68.5)
Christianity	46 (31.5)
Previous training on use of uterine tamponade	
Yes	68 (46.6)
No	78 (53.4)

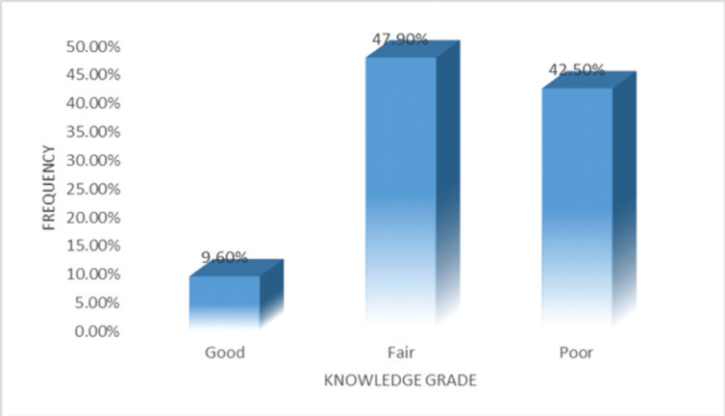

Figure: Respondent's knowledge of uterine tamponade

Table 2: Association between knowledge score and socio demographic characteristics

Variables	Knowledge			χ^2	p-value
	Poor (n=62) N (%)	Fair (n=70) N (%)	Good (n=14) N (%)		
Age groups				5.356	0.499
19 – 28	15 (38.5)	17 (43.6)	7 (17.9)		
29 – 38	24 (42.9)	28 (50.0)	4 (7.1)		
39 – 48	17 (45.9)	17 (45.9)	3 (8.1)		
49 – 58	6 (42.9)	8 (57.1)	0 (0.0)		
Sex				0.022	0.989
Male	8 (42.1)	9 (47.4)	2 (10.5)		
Female	54 (42.5)	61 (48.0)	12 (9.4)		
Professional group				26.377	**0.001**
Doctor	1 (10.0)	6 (60.0)	3 (30.0)		
Nurse	3 (50.0)	3 (50.0)	0 (0.0)		
Nurse/Midwife	18 (35.3)	31 (60.8)	2 (3.9)		
Midwife	13 (37.1)	14 (40.0)	8 (22.9)		
Community health worker	27 (61.4)	16 (36.4)	1 (2.3)		
Marital status				4.825	0.566
Single	11 (29.7)	21 (56.8)	5 (13.5)		
Married	49 (46.2)	48 (45.3)	9 (8.5)		
Divorced	1 (50.0)	1 (50.0)	0 (0.0)		
Widowed	1 (100.0)	0 (0.0)	0 (0.0)		
Tribe				9.998	0.441
Nupe	29 (48.3)	27 (45.0)	4 (6.7)		
Gwari	9 (40.9)	8 (36.4)	5 (22.7)		
Hausa	10 (35.7)	17 (60.7)	1 (3.6)		
Igbo	3 (42.9)	4 (57.1)	0 (0.0)		
Yoruba	4 (30.8)	7 (53.8)	2 (15.4)		
Others	7 (43.8)	7 (43.8)	2 (12.5)		
Point of service				3.320	0.190
Primary facility	29 (51.8)	22 (39.3)	5 (8.9)		
Secondary facility	33 (36.7)	48 (53.3)	9 (10.0)		
Duration of experience in child delivery(years)				2.888	0.577
< 4	17 (35.4)	24 (50.0)	7 (14.6)		
5 – 9	20 (44.4)	22 (48.9)	3 (6.7)		
> 9	25 (47.2)	24 (45.3)	4 (7.5)		
Previous training on use of uterine tamponade				3.977	0.137
Yes	23 (33.8)	37 (54.4)	8 (11.8)		
No	39 (50.0)	33 (42.3)	6 (7.7)		

Significant level at p<0.05

Table 3: Respondent's attitude towards use of uterine tamponade in management of severe post-partum hemorrhage

Variables	Agree N (%)	Disagree N (%)	Indifferent N (%)
I can refer any woman with post -partum hemorrhage to the facility with the commodities for uterine tamponade after failure of uterotonic drugs	127 (87.0)	7 (4.8)	12 (8.2)
A patient's fertility cannot be preserved following the use of uterine tamponade	21 (14.4)	98 (67.1)	27 (18.5)
Uterine tamponade is a complex procedure which is not necessary to be adopted to manage a case of postpartum hemorrhage not amenable to utero tonic drugs	17 (11.6)	98 (67.1)	31 (21.3)
Uterine Tamponade can avert the need for surgical intervention in majority of women with post -partum hemorrhage secondary to uterine atony after failure of utero-tonic agents	135 (92.5)	2 (1.4)	9 (6.1)
I prefer the use of surgical removal of uterus to the use of the Uterine tamponade in the management of postpartum hemorrhage secondary to uterine atony after failure of utero-tonic drugs	11 (7.5)	122 (83.6)	13 (8.9)
Uterine tamponade is always associated with complications	25 (17.1)	88 (60.3)	33 (22.6)
It is comfortable to use uterine tamponade in the management of postpartum hemorrhage	121 (82.9)	9 (6.2)	16 (11.0)
The commodities for the tamponade are not readily available	40 (27.4)	80 (54.8)	26 (17.8)
The procedure is a function of higher-level health personnel	60 (41.1)	68 (46.6)	18 (12.3)

Table 4: Relationship between attitudinal scale and socio demographic characteristics

Variables	Attitude		χ^2	p-value
	Poor (n=26) N (%)	Good (n=120) N (%)		
Age groups			2.701	0.440
19 – 28	10 (25.6)	29 (74.4)		
29 – 38	8 (14.3)	48 (85.7)		
39 – 48	5 (13.5)	32 (86.5)		
49 – 58	3 (21.4)	11 (78.6)		
Sex			0.157	0.692
Male	4 (21.1)	15 (78.9)		
Female	22 917.3)	105 (82.7)		
Professional group			12.388	**0.015**
Doctor	0 (0.0)	10 (100.0)		
Nurse	1 (16.7)	5 (83.3)		
Nurse/Midwife	6 (11.8)	45 (88.2)		
Midwife	4 (11.4)	31 (88.6)		
Community health worker	15 (34.1)	29 (65.9)		
Religion			0.142	0.707
Islam	17 (17.0)	83 (83.0)		
Christianity	9 (19.6)	37 (80.4)		
Marital status			3.332	0.343
Single	10 (27.0)	27 (73.0)		
Married	16 (15.1)	90 (84.9)		
Divorced	0 (0.0)	2 (100.0)		
Widowed	0 (0.0)	1 (100.0)		
Tribe			6.219	0.285
Nupe	14 (23.3)	46 (76.7)		
Gwari	3 (13.6)	19 (86.4)		
Hausa	4 (14.3)	24 (85.7)		
Igbo	0 (0.0)	7 (100.0)		
Yoruba	4 (30.8)	9 (69.2)		
Others	1 (6.3)	15 (93.7)		
Point of service			9.774	**0.002**
Primary facility	17 (30.4)	39 (69.6)		
Secondary facility	9 (10.1)	81 (89.9)		
Duration of experience in child delivery(years)			0.908	0.635
< 4	8 (16.7)	40 (83.3)		
5 – 9	10 (22.2)	35 (77.8)		
> 9	8 (15.1)	45 (84.9)		
Previous training on use of uterine tamponade			9.506	**0.002**
Yes	5 (7.4)	63 (92.6)		
No	21 (26.9)	57 (73.1)		

Table 5: Respondent's experience with uterine tamponade

Variables	Frequency n (%)
Practice of the use of uterine tamponade (n=66)	
Yes	20(30.3%)
No	46(69.7%)
Reasons (n=46)	
Fear of being blamed for incorrect insertion	1 (2.2)
Lack of adequate knowledge of the procedure of insertion	29 (63.0)
Previous experience which was unsatisfactory seen from those who have managed PPH with uterine tamponade	1 (2.2)
Unavailability of management protocol for Guidance	5 (10.9)
Unavailability of the commodities	9 (19.6)
No indication for the use of uterine tamponade on the cases of postpartum hemorrhage I have managed	9 (19.6)
Application of Uterine Tamponade has not started in our center	5 (10.9)

Multiple Responses

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