

## An Audit of Active Management of Third Stage of Labour in a Tertiary Hospital

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### Abstract

**Background:** Postpartum haemorrhage is a potentially life-threatening, but preventable condition which is the leading cause of maternal mortality globally. Active management of third stage of labour, has been found to be a useful intervention in the prevention of primary postpartum haemorrhage. However, the recent modification in the traditional Active management of third stage of labour by Royal College of Obstetricians and Gynaecologist, guideline would necessitate the auditing of our Active management of third stage of labour and postpartum haemorrhage in this centre.

**Aim:** To determine the effectiveness of Active management of third stage of labour in prevention of postpartum hemorrhage in Aminu Kano Teaching Hospital, Kano .

**Methods:** This is a two-year retrospective descriptive study done at Aminu Kano Teaching Hospital, Kano. Records of patients who delivered in this hospital, those that had AMTSL and those that had PPH were retrieved from the labour ward delivery record book. Patients' case files were retrieved, studied and recorded in a proforma. These were compared with the criteria obtained from the Royal College of Obstetricians and Gynaecologist guidelines. Data collected was fed into the computer and analyzed using SPSS Statistics version 19 software.

**Results:** During the study period, there were 4,827 clients that had vaginal delivery with active management of third stage of labour. One hundred and seven of them had postpartum hemorrhage, thus giving an incidence of 2.2%. Among the 107 cases, only 84 (78.5%) case notes could be retrieved from the medical records department and the labour ward register and these were the ones analyzed. Twenty-three (21.5%) case note could not be retrieved.

Among the 84 women whose case records were retrieved, the mean age of the subjects was 32 years S.D +/-1.3 years. The most common risk factor for Post-partum haemorrhage is Abruptio placentae (53.3%). Administration of oxytocin and Controlled cord traction achieved standard for prevention of postpartum haemorrhage (95.2%).

**Conclusion:** This audit shows that Active management of third stage of labour by the use of oxytocics immediately after delivery and Controlled cord traction remain as effective as the recent World Health Organization revised Active Management of third stage of labour which involved use of oxytocics alone, in the prevention of postpartum haemorrhage.

**Keywords:** Active management, third stage, labour, postpartum haemorrhage

## Introduction

The third stage of labour is defined as the time between the birth of the baby and the delivery of the placenta and membranes. It is the third stage that is the most perilous for the woman because of the risk of postpartum hemorrhage (PPH).<sup>1</sup>

Postpartum haemorrhage is excessive bleeding following delivery (>500mls) or bleeding after delivery that will cause hemodynamic instability in the patient. It's a major cause of maternal morbidity or mortality hence the advent of active management of third stage of labour.<sup>2</sup>

Active Management of third stage of labour (AMTSL) as a prophylactic intervention is composed of a package of three components or steps: administration of a uterotonic, preferably oxytocin, immediately after birth of the baby; controlled cord traction (CCT) to deliver the placenta; and thirdly massage of the uterine fundus after the placenta is delivered.<sup>3</sup> In 2012, the results of a large WHO-directed, multi-centered clinical trial were published and showed that the most important AMTSL component was the *administration of a uterotonic*.<sup>4</sup>

Oxytocin is the most commonly used agent and the primary drug of choice in the third stage of labour (TSL). Oxytocin's action is unique to the smooth muscles of the uterus;

it increases the amplitude and frequency of contractions.<sup>4</sup>

Oxytocin can be used just after delivery of the anterior shoulder of the baby or expulsion of the placenta. Generally, its administration route and dose are 10 IU intramuscularly (IM). It can also be used intravenously (IV), which is typically preferred during cesarean sections (CS). A newly developed oxytocin tablet has recently been presented that can be applied successfully via the sublingual route.<sup>5</sup> An *in vitro* study showed a >30% reduction in tissue transepithelial electrical resistance after treatment with the oxytocin fast-dissolving tablet, implying an increase in the permeability of the mucosal tissue to oxytocin.<sup>5</sup> In a 600-patient study from Turkey, there was no statistically significant difference in the amount of postpartum blood loss between IM and IV administration.<sup>6</sup> Oxytocin also decreased postpartum blood loss when applied inside the placental cord.<sup>7</sup>

Ergometrine (methergine) is an ergot alkaloid which exerts various effects throughout the body on at least three different types of receptor. They are non-selective 5-hydroxytryptamine 1 agonists and have affinities for dopamine and noradrenalin receptors. Ergot alkaloids are absorbed rapidly and completely after oral administration. Both are usually effective within 1-5 min after an IM injection.<sup>6,7</sup>

In a study comparing the efficacy of rectal misoprostol 400 µg, oxytocin 10 IU injected IM, methylergometrine 0.2 mg injected IV, and 0.5 mg ergometrine + 5 IU oxytocin injected IM in reducing blood loss in the TSL.<sup>8</sup> They found that methylergometrine had the “best” uterotonic drug profile (lowest blood loss during the third stage and duration of the TSL). However, the study had several limitations. Most importantly, it was not a randomized study, the trial was not double-blinded, leading to the possibility of biased results, and no power calculation was reported.<sup>8</sup> Ergometrine causes sustained uterine contraction of the uterus, however, its use must be avoided in patients with hypertension.<sup>8</sup>

Syntometrine contains 5 IU oxytocin and 0.5 mg ergometrine.<sup>9</sup> The time of onset of the uterine response after IM administration is shorter than after ergometrine alone, and the duration of action is several hours. Although it was found to be more effective than oxytocin in a review, however the adverse effect profile (hypertension, nausea, vomiting) restricts its use.<sup>9</sup>

Misoprostol is a synthetic prostaglandin E1 derivative. It is an inexpensive drug and is stored readily. It does not cause high blood pressure and can be used in patients with asthma.<sup>10</sup> Its most common adverse effect is flushing. Although the amount of blood loss has been shown to have been reduced with prophylactic use of misoprostol in many studies, it is not as effective as oxytocin. Consequently, oxytocin is the first choice for the prophylaxis of PPH.<sup>10, 11</sup> In countries where the socioeconomic level is very low and home deliveries are common, misoprostol can be used as the first-line drug; it can be used orally, rectally or sublingually. The route of administration and dose differ from country to country. The WHO and International Federation of Gynaecology and Obstetrics recommend a single dose of 600 µg misoprostol, oral or sublingual, for the prophylaxis of PPH.<sup>12</sup> In a

prospective randomized trial published in 2016, it was shown that the additional use of buccal misoprostol in conjunction with active management of the TSL reduced the need for additional uterotonic drugs.<sup>13</sup>

Carbetocin is a long-acting synthetic analogue of oxytocin with agonist properties, which binds to oxytocin receptors in the uterine smooth muscle, resulting in rhythmic contractions and increased uterine tone. When administered intravenously, it causes sustained uterine contractions within 2 minutes, lasting for about 6 minutes and followed by rhythmic contractions for 60 minutes, while intramuscular administration will cause sustained uterine contractions lasting for about 11 minutes and rhythmic contractions for 120 minutes. It has a half-life of 40 minutes.<sup>14,15</sup>

Injectable prostaglandins (systemic) trailed for PPH prevention include prostaglandin F2α analogues (carboprost), prostaglandin E2 (dinoprostone) and prostaglandin E2 analogues (sulprostone). When given intramuscularly achieve a peak plasma concentration within 15-60 minutes. Has a half-life of 8 minutes and requires a storage at 2–8 °C to prolong its shelf life.<sup>16,17</sup>

Controlled cord traction, although was recommended in the 2007 WHO guidelines, it is described as optional for the active management of the third stage in the 2012 updated guidelines<sup>(3)</sup>. An inexperienced operator may cause serious complications, such as uterine inversion. In WHO studies, it was accepted as ineffective for decreasing blood loss. However, according to a meta-analysis reported in 2015, although the risk of blood loss above 1000 ml was not decreased with controlled cord traction, the mean time of the third stage, the mean blood loss (less than 10 ml), and the risk of blood loss less than 500 ml were all decreased.<sup>18</sup> The authors noted that controlled cord traction still had a place in active management when performed by experienced personnel. It is also a recommended method for CS.<sup>19</sup>

Uterine fundal massage after placental expulsion provides uterine contractions by stimulating endogenous prostaglandin secretion. This method was recommended in the 2007 WHO guidelines, and was described as optional for the active management of the third stage in the 2012 updated guidelines<sup>(3)</sup>.

Postpartum hemorrhage is a potentially life-threatening but preventable condition that is the leading cause of maternal death. Active management of the third stage of labor (AMTSL) can prevent its occurrence. Active management of third stage of labour is a recommended series of steps, including the provision of uterotonic drugs immediately upon fetal delivery, controlled cord traction, and massage of the uterine fundus, as developed by the World Health Organization. According to the most recent Cochrane analysis, active management of TSL decreases the risk of postpartum bleeding of over 100 ml. The recent modification of RCOG guideline<sup>3,4</sup> on AMTSL has made it imperative for this Centre to evaluate the impact of its AMTSL in prevention of postpartum haemorrhage.

### **Aim**

The aim of this study was to show the effectiveness of AMTSL in prevention of postpartum hemorrhage in AKTH, Kano.

### **Materials and Methods**

This was a retrospective study based on findings obtained from the labour ward register and case folders of women who delivered vaginally at Aminu Kano Teaching Hospital (AKTH), Kano within the two-year study period, between January 2017 and December 2018, with PPH as a complication to extract information such as the Personal data, age, Parity, Place of delivery, AMTSL. Aminu

Kano Teaching Hospital is a 500 bed tertiary health institution serving Jigawa, Katsina, Yobe, Gombe, Kaduna and Bauchi states in Northwestern Geo-political zone of Nigeria. It also provides training facilities for medical students, nurses, laboratory technologist and post graduate trainings. Kano State lies between latitude 11°30' North and longitude 8°30' East. It is the second largest city in Nigeria and is located in Northern Nigeria. According to 2006 census, the population of Kano city is 2,828,861 and for the State is 9,383,682.

Blood loss following vaginal delivery was estimated by both visual inspection and gravimetric method by weighing delivery pads, use of standard kidney dishes and gali pots for measurement of blood loss. Postpartum haemorrhage was also determined by any compromise in the cardiovascular status of the patient following vaginal delivery.

Audit standard were administration of oxytocin immediately after delivery of the fetus and controlled cord traction in the presence of a trained personnel.

These were compared with the criteria obtained from the RCOG guidelines. Information collected with the data sheets was fed into the computer and analyzed using SPSS Statistics version 19 software.

### **Results**

During the study period, there were 4,827 clients that had vaginal delivery. One hundred and seven of them had postpartum hemorrhage, thus giving an incidence of 2.2%.

Among the 107 cases, only 84 (78.5%) case notes could be retrieved from the medical records department and the labour ward register and these were the ones analyzed. Twenty-three (21.5%) case notes could not be retrieved.

Among the 84 women whose case records

were retrieved, the mean age of the subjects was 32 years S.D +/-1.3 years. Most of the subjects are multiparous women with parity of 2-4 (42.9%)

Over a third of the subjects (34.5%) were within 25-29 years of age, while the least (2.4%) were older than 41 years. Most of the women were multiparous 36(42.9%). (Table 1). Fifty-eight percent (58%) of the women were booked while 42% were unbooked (Figure1).

Majority of the patients 80(95.2%) delivered at AKTH with only 4(4.8%) that delivered elsewhere. Table 2

The commonest risk factor for PPH is abruption placentae (53.3%) while the least common risk factors are retained placenta, vacuum delivery and induction of labour (6.7%). Table 3.

The use of oxytocin and CCT achieved the standard for prevention of PPH in 80 patients (95.2%), who had vaginal delivery.

Variables	Frequency	Percentage (%)
Age(years)		
<20	10	11.9
20-24	15	17.9
25-29	29	34.5
30-34	14	16.7
≥35	16	19.0
Total	84	100

Parity		
1	15	17.9
2-4	36	42.9
>5	33	39.2
Total	84	100

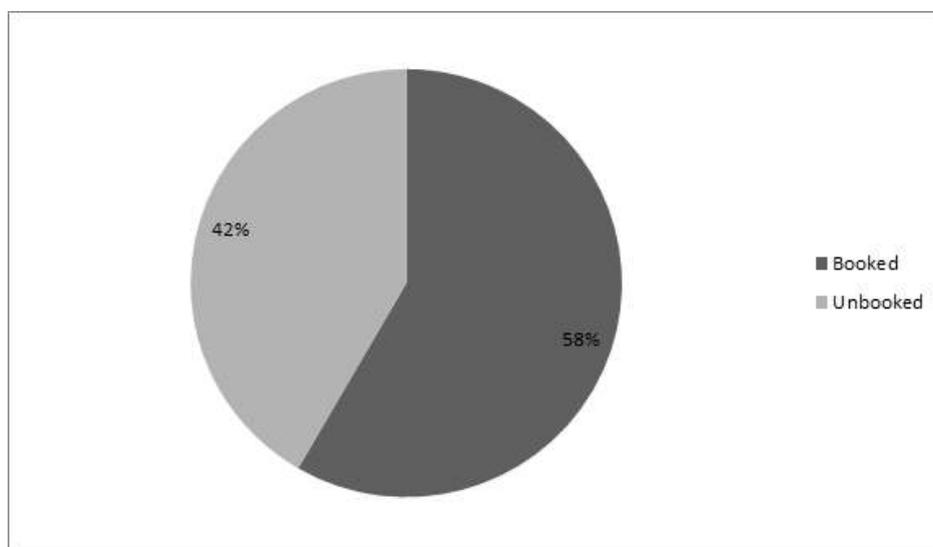


Fig 1: Booking Status among Patients with PPH

Table 2: Place of Delivery among Patients

Patient's Place Of Delivery	Frequency	Percentage (%)
Akth	80	95.2
Elsewhere	4	4.8
Total	84	100

Table 3: Risk Factors for PPH

Risk Factors	Frequency	Percentage (%)
Abruptio placentae	16	53.3
Severe preeclampsia	5	16.7
Twin pregnancy	3	10
Retained placenta	2	6.7
Vacuum delivery	2	6.7
Induction of labour	2	6.7
Total	30	100

Table 4; Frequencies and Percentages of Standards achieved

Criteria	Frequency	Percentages achieved
Administration of oxytocics within 1minute of delivery	80	95.2
Controlled cord traction	80	95.2

## Discussion

The most recent Cochrane analysis, shows that active management of the TSL decreases the risk of postpartum bleeding by over 1000 ml.<sup>20</sup> While the global estimate of PPH was found to be 5-12%<sup>20</sup>, in this study, however, the incidence of postpartum haemorrhage was 2.2%, which is similar to an earlier study in this facility 2.47<sup>21</sup> and Jos 2.72%<sup>23</sup> but lower than 4.2% seen in Ilorin<sup>23</sup> and 4.28% in Port Harcourt.<sup>24</sup> The low incidence of PPH in this study, could be due to the fact that the study considers only patients who had vaginal delivery, while that of Ilorin and

Port Harcourt considered both vaginal delivery and caesarean section. Majority of the Patients fall within the age group 26 and 30 years, this is similar to the finding by Mutihir and Utoo et al in Jos<sup>22</sup>. Multiparity and grandmultiparity accounted for 82% of patients with PPH. This is because they are known risk factors for PPH and was similar to the findings in Port Harcourt<sup>24</sup> which was a general trend observed in many studies among African Population<sup>21,25</sup>.

Almost all of the patients in this study 95.2% delivered in our facility and majority of them were booked, this is similar to the study by Mutihir and Utoo et al<sup>22</sup>, but

contrary to the finding by Garba et al<sup>21</sup> in kano and Green K I et al in Portharcourt<sup>23</sup>. This was because of the increasing number of patients accessing the facility for both booking and delivery. The few that did not deliver in the hospital were not opportuned to have an AMTSL hence a higher risk of PPH. Grand multiparty and Abruptio placentae (53.3%) were found to be important risk factor for PPH. This is because any of these two complications will lead to uterine atony which is the commonest cause of PPH worldwide<sup>26</sup>.

This study shows that there was appropriate management of third stage of labour, because out of the 4,827 women that delivered vaginally during the study period, only 107 had PPH out of which 30 had strong risk factors for developing PPH. This study has shown that all the women that delivered in this facility were given 10i.u intramuscular oxytocin (oxytocic of choice)<sup>27</sup> immediately after delivery as the most important component of AMTSL,<sup>3</sup> with the removal of placenta by controlled cord traction which is the second component of AMTSL that is now considered optional. The WHO trial<sup>4</sup> demonstrated that the addition of CCT did almost nothing to reduce haemorrhage. The women who received CCT bled 10ml less (on average) than women who delivered their placenta by their own effort. There was a real difference, however, in terms of the length of the third stage: third stage was an average of 6 minutes longer among those women who did not receive CCT. The authors acknowledged that this can be an important amount of time, which could be saved for the management of other women in very busy labour ward just like ours, hence its implementation.<sup>3</sup>

The third component of AMTSL is uterine massage which is done every 15 minutes for

2hours after delivery and is not routinely practiced, considering data from this trial<sup>4</sup> and the existing evidence concerning the role of routine uterine massage in the prevention of PPH, the WHO issued new recommendations clarifying that although administration of a uterotonic remains central to the implementation of AMTSL, the performance of CCT and immediate fundal massage are optional components<sup>3</sup>.

### Conclusion

This audit shows that Active management of the third stage of labour by the use of oxytocics immediately after delivery and CCT remain as effective as the recent WHO revised AMTSL which involved use of oxytocics alone, in the prevention of postpartum haemorrhage.

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