EFFECT OF CLINICAL PATHWAY ON PREVENTING POSTPARTUM HEMORRHAGE DURING FOURTH STAGE OF LABOR

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ABSTRACT

Postpartum hemorrhage (PPH) is a major cause of maternal mortality & sever morbidity all over the world especially in developing countries. It causes 25% of maternal death.

Aim of the study was to evaluate the effect of clinical pathway on preventing postpartum hemorrhage during fourth stage of labor. Design: A Quasi-experimental design. (non-equivalent groups) was utilized.

Setting: This study was carried out at the delivery and postpartum unit in Maternity and Gynecological Hospital at Cairo University Hospital.

Sample: A total of 360 women were recruited immediately after delivery during fourth stage of labor with inclusion criteria.

Tools three tools were utilized to collect data: 1) demographic & obstetrical data tool, 2) postpartum maternal assessment tool and 3) postpartum follow up assessment tool.

Result; there was a statistical significant difference between the study and control groups regarding to uterine condition which revealed (98%, 94.4% respectively) had firmed uterus. (98%, 94.4% respectively) in the study & control group had moderate amount of lochia with total mean (242.5±53, 302± 33.1respectively), (95%, 85%) of women in the study & control groups discharge d within 6hrs after delivery.

Conclusion: It was concluded that, women who received the designed nursing clinical pathway were less likely to develop PPH than those who exposed to the routine hospital care, this improvement was obvious in relation to the amount of blood loss, stability in vital sign, improvement in uterine condition & consistency, and shortened length of hospital stay.

Recommendations: based on the study findings, the following was recommended: Postpartum hemorrhage guidelines & protocols should be applied and used in maternity hospital.

Key words: postpartum hemorrhage, clinical pathway, fourth stage of labor

I. INTRODUCTION

Postpartum hemorrhage (PPH) is a potentially life-threatening complication that can occur after both vaginal and cesarean births. It is a major cause of maternal death and morbidity in both developed and developing countries, accounting for about 35% of all maternal deaths. Every year approximately one in twenty birth (agency for health care research and quality) AHRQ, (2015).

Primary prevention of a PPH begins with an assessment of identifiable risk factors. Pregnancy and childbirth involve significant health risks, even for women with no pre-existing health problems. Delays in recognition, diagnosis, and treatment, problems with hierarchy, communication, and lack of knowledge, policies, and protocols were often cited as contributing factors. shields, (2015)
The period after the birth and the first hours postpartum are crucial time for the prevention, assessment, and management of bleeding, compared with other maternal risks such as infection & bleeding can rapidly become life threatening. Nurses, along with other health care providers, need to identify this condition quickly and intervention appropriate. Susan, (2017) The midwife is often the first, and may be the only, professional person present when a hemorrhage occurs, so her prompt, competent action will be crucial in controlling blood loss and reducing the risk of maternal morbidity or death. Jayne, & Maureen, (2016)

II. SIGNIFICANCE OF THE STUDY
Internationally, postpartum hemorrhage accounts for one of the three major causes of maternal mortality. According to WHO, 25% of all pregnancy related deaths result from postpartum hemorrhage, and more than 50% of all hemorrhage-related deaths have been shown to be preventable. Cunningham, (2014)

In the developing world about 1.2% of deliveries are associated with PPH and when PPH occurred about 3% of women died. Globally it results in 44,000 to 86,000 deaths per year making it the leading cause of death during pregnancy. About 0.4 women per 100,000 deliveries die from PPH in the United Kingdom while about 150 women per 100,000 deliveries die in sub-Saharan Africa. FIGO, (2015).

Egypt has an improved but relatively high maternal mortality ratio of 84 maternal deaths per 100,000 live births, although 60% of births are medically assisted and 49% are facility based. And PPH remains the leading cause contributing to 27% of maternal deaths, with poor obstetric management cited as the most frequent avoidable factor, contributing to 43% of maternal deaths (Dupont, 2014). According to (WHO, 2016) maternal mortality rate in Egypt become 33 maternal deaths per 100,000 live births. About 20% of maternal deaths nationwide are due to postpartum hemorrhage. Vlassoff, (2016).

Aim of the study
This study aimed to evaluate the effect of clinical pathway on preventing postpartum hemorrhage during fourth stage of labor

Research Hypothesis
H1. Women who receive the clinical pathway will be less likely to develop postpartum hemorrhage

III. MATERIALS AND METHODS

Research Design:
Quasi experimental (non equivalent group) as it suits the nature of the study.

Sample:
A total of 360 postpartum women were recruited immediately after delivery (during the 4th stage of labor) and divided Randomly into two groups, First group (180) women who received the routine care of the hospital (control group) ;the second group (180) women who received the clinical pathway (study group). The research investigator determined one day for collecting data from the study group while other day for collecting data from the control group. Women who had caesarian section and traumatic procedure were excluded

Setting:
The current study was carried out at the delivery and postpartum unit in Maternity and Gynecological Hospital at Cairo University Hospital. This unit received approximately 50-80 women per day about 7411 normal vaginal delivery women per year (Statistics delivery unit, 2018). this unite contain 24 beds, this unite provided care to normal vaginal delivery & CS delivery during postpartum period.
Tools for data collection

1. Demographic & Obstetrical data tool
Which included personal data such as age, educational level, occupation, residence and telephone number, obstetric profile & complication during previous and current pregnancy, labor & postpartum (postpartum hemorrhage).

2. Postpartum Maternal Assessment Tool
This tool included assessment of the postpartum women immediately after delivery for 6 hour postpartum. Which contain assessment of vital sign (BP,P,R), lochia (amount, content, odor), uterus (consistency, position), and blood loss which estimated by measurement number and weight of pad using sensitive weighting scale.

3. Postpartum Follow up Maternal Assessment Tool
This tool included assessment of the postpartum women after discharge at 12 hours postpartum and at 24 hours done by phone. which contain assessment of lochia (amount, content, odor), uterus (consistency, position), and blood loss which estimated by measurement number of pads and if it soaked or not

Tools validity & reliability
Tools were validated by a panel of five experts in the field of maternity nursing and modifications were carried out. Reliability was tested usding cronbach's alpha was 0.98.

Ethical consideration
A primary approval was granted from ethics research committee of the faculty of nursing, Cairo university. Also, an official permission was granted from the administration personnel in the postpartum unite at El Manial maternity university hospital to conduct the proposed study. After completion of the data collection process, Written informed consent was obtained from each women and they were informed them about the purpose of the study in order to obtain their acceptance to participate in this study, Also, emphasized that the study posed no risks or hazards on women's health. All women were informed that their Participation in this study is voluntary and any one can withdraw from this study at any time without giving any reasons. Confidentiality of the women information was assured through coding the data, and also data didn't reuse in another research without their acceptance.

Pilot study
Thirty-six women (10%) were recruited for the pilot study based on the total number of the of sample. the pilot study was carried out to check clarity of items in the tools questions, time consumed to ask and answer the questions. Also the pilot study was carried out to examine the applicability of the study procedures.

Procedure
Relevant data was collected based on tools. the duration was one years to collect all sample

Preparatory & Assessment phase:
This phase was concerned with constructing and preparing different data collection tools, designing the frame of the clinical pathway, an administrative approval was obtained from authorative personnel to conduct the study, conducting the pilot study, Then the research investigator obtained written consents from all participants after explaining the purpose and nature of the study and their ethical rights.

The implementation phase:
The research investigator start to implement clinical pathway which will be Adapted from WHO guidelines and pathway 2012. After obtained base line assessment data from both groups, the implementation carried out to the women in the study group while the control group received the routine care which given in the hospital. The investigator started to provide clinical pathway to each women in the study group which began immediately after delivery (4th stage of labor) as in the 1st hour, the investigator assess vital sign, uterus, lochia,& blood loss every 1/4 hrs, and in the 2nd hr. every 1/2 hr. and then every 4hrs until women discharged. the investigator also, made uterine massage, evacuated bladder, assisted women to initiate breast feeding according to developed clinical pathway and time frame. the investigator spend approximately 4-6 hours per shift(morning shift) for each visit, In
postpartum unite to provide care to P.P women in the study group. Also, investigator provide health information to women about the importance of regular breastfeeding, how to assess amount of lochia, how to palpate the uterus to ensure hard condition of it.

Follow-up & Evaluation phase:

Women in both groups were followed-up after discharge by the investigator through phone calls twice, 1st time 12hrs after discharge & 2nd time 24hrs after discharge, while the investigator ask about lochia, uterus, breastfeeding and amount of blood loss( appendix3) and women asked to return to hospital if there is bleeding( excess blood loss), high temperature, & sever pain in leg.

IV. STATISTICAL ANALYSIS:

Data were analyzed using statistical package for the social science (SPSS) version 20. Numerical data expressed as means and standard deviations. Qualitative data expressed as frequency and percentage. Chi-square test used to examine the relationship between qualitative variables. Repeated quantitative variables, unpaired T test used for comparison. Probability of error (p-value) < 0.05 considered significant

V. FINDINGS

Table(1) Distribution of Women in Both Groups Related to Risk factor Cause Postpartum Hemorrhage in present Pregnancy(N=180).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Control group</th>
<th>Study group</th>
<th>X²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N=180</td>
<td>N=180</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>157</td>
<td>153</td>
<td>16.553</td>
<td>0.872</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>23</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multipl gestation</td>
<td></td>
<td>7</td>
<td>7</td>
<td>25.9%</td>
<td></td>
</tr>
<tr>
<td>polhydramonis</td>
<td></td>
<td>4</td>
<td>5</td>
<td>18.5%</td>
<td></td>
</tr>
<tr>
<td>Large baby</td>
<td></td>
<td>8</td>
<td>12</td>
<td>44.4%</td>
<td></td>
</tr>
<tr>
<td>Choroamnioits</td>
<td></td>
<td>4</td>
<td>3</td>
<td>11.11%</td>
<td></td>
</tr>
</tbody>
</table>

Figure (1) Distribution of Women in both Groups Related to Uterine Condition (consistency) During hospitalization after Labor (n=180)
Table (2) Distribution of Women in Both Groups Related to Mean of Amount of Lochia During Hospitalization After Delivery N= 180

<table>
<thead>
<tr>
<th>Amount of Lochia</th>
<th>Study group</th>
<th>Control group</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st hour</td>
<td>65 ± 5.4</td>
<td>65 ± 5.7</td>
<td>2.51</td>
<td>0.13</td>
</tr>
<tr>
<td>2nd hour</td>
<td>49.23 ± 2.5</td>
<td>50 ± 7.3</td>
<td>2.95</td>
<td>0.000*</td>
</tr>
<tr>
<td>After 6 hour</td>
<td>41.77 ± 7.1</td>
<td>45 ± 6.3</td>
<td>2.95</td>
<td>0.000*</td>
</tr>
<tr>
<td>Total mean</td>
<td>242.52 ± 53.46</td>
<td>302 ± 31.3</td>
<td>69.8</td>
<td>0.00*</td>
</tr>
</tbody>
</table>

* Significant at the p < 0.05 probability level NS= not statistically significant

Table (3) Distribution of the Women in Both Groups Related to Time Of Discharge from hospital (N=180)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Groups</th>
<th>X² test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study group</td>
<td>Control group</td>
</tr>
<tr>
<td>Discharge from hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early discharge(4-6hrs)</td>
<td>175 97.2%</td>
<td>164 91.1%</td>
</tr>
<tr>
<td>Delay Discharge (12-72 hrs)</td>
<td>5 2.8%</td>
<td>16 8.9%</td>
</tr>
<tr>
<td>Reasons for delay discharge within 12 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHH</td>
<td>4 2.2%</td>
<td>10 5.5%</td>
</tr>
<tr>
<td>Cardiac disease</td>
<td>1 0.6%</td>
<td>2 1.2%</td>
</tr>
<tr>
<td>RH incompatibility</td>
<td>0 0%</td>
<td>4 2.2%</td>
</tr>
<tr>
<td>Delay Discharge after 24 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasons for delay discharge after 24 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHH</td>
<td>4 2.2%</td>
<td>10 5.5%</td>
</tr>
<tr>
<td>Cardiac disease</td>
<td>0.0 0.0%</td>
<td>1 0.6%</td>
</tr>
</tbody>
</table>
Result of study sample characteristics: 61.7% of the women in the study group their age was ranged between 21-30 years as compared to 68.9% in the control group, with mean age 26.40 ± 6.3400 in the study group as compared to 26.38 ± 5.555 in the control group, 49.4% & 50% respectively of the women in study & control group cannot read & write, while 31.2% of the women in the study group were para 1 as compared to 27.3% in the control group.

Table (1) comparing the Risk factor Cause Postpartum Hemorrhage in present Pregnancy between the study & control group in which there was no statistically significant difference as multiple gestations, polyhydramnios, large baby and chorioamnionitis.

Figure (1) comparing Uterine condition (consistency) during hospitalization after labor at first hour, 2nd, and after 6hrs postpartum there was no statistical significant difference between both groups (t=21.95, p= 0.12) at the first hours. While, in the 2nd hr and after 6hrs postpartum there was a statistical significant difference between both groups (t=2.56 at p=0.000).

Table (2) comparing mean amount of lochia during hospitalization after labor at first hour, 2nd, and after 6hrs postpartum there was no statistical significant difference between both groups (t =2.51 at p=0.13) at the first hours. While, in the 2nd hr and after 6hrs postpartum there was a statistical significant difference between both groups (t =2.95 at p=.000), (t =69.8 at p=.000).

Table (3) comparing the Time Of Discharge from hospital between the study & control group there was a statistically significant difference between both groups (X²=10.29, p= 0.007). Reasons of delayed discharge within 12 hrs were PPH, cardiac disease and RH incompatibility.

Figure (2) comparing the Follow up Assessment of uterine condition After Discharge at 12Hours & 24 Hours as Reported by Women between the study & control group there was a statistically significant difference between both groups (X=35.01, p= 0.000).

VI. DISCUSSION

In this section, the research investigator attempted to find out the effect of clinical pathway on preventing postpartum hemorrhage during fourth stage of labor. The findings of this study supported the research hypothesis in which "women who receive clinical pathway will less like to develop Postpartum Hemorrhage."

Finding of the current study indicate that There was a statistical significant differences between both groups regarding to uterine condition (consistency) it was improved gradually by time at 2nd, and after 6hrs postpartum which become more contracted in the study group than in the control group, in spite of the majority of women in the study & control groups had contracted uterus but there was a with statistical significant difference between both groups at 2nd & after 6 hrs (p=0.005 & p= 0.000 respectively). the study findings are in congruent with the study findings conducted by Abdelmenem, (2019) who evaluate the effect of early maternal and newborn skin to skin contact.
contact after birth on the duration of third stage of labor and initiation of breastfeeding, reported that the skin to skin contact group had well contracted uterus, less need for uterotonic drugs and no uterine atony or excessive blood loss have been recorded compared to the control group. On the other hand, the study finding of the current study are not congruent with the study done by Garba, (2019) assess Appropriate Documentation of the Timing of Events in the Management of Women with Postpartum Hemorrhage, reported that most of the women (90.5%) had primary PPH, while uterine atony was the most common cause of PPH (79.8%), retained products, genital tract lacerations, and uterine rupture accounted for 7.1%, 10.7%, and 2.4%, respectively.

Finding of the current study indicated that There was a statistical significant differences between both groups regarding to blood loss after 2 hrs and after 6 hours after delivery (t =2.95 at p=0.000*) these result are matched with, the study finding conducted by Asuquo, & Egede, (2017) who assess postpartum vaginal blood loss following two different methods of cervical ripening, comparison of blood loss in vaginal deliveries between the two groups revealed that subjects in the misoprostol group had significantly higher blood loss than subjects in the Foley catheter group (488 ± 222 versus 326 ± 106, p<0.05), there was strong and statistically significant positive correlation between postpartum blood loss and induction delivery interval (r=0.75, p<0.0001 ; r=0.77, p<0.0001 ). in the other hand, the study findings of the current study are not congruent with the study findings conducted by Liabsuetrakul & Choobun, (2018), who assess Ergo talkaloids versus no uterotonic agents Use of ergotalkoids in the third stage of labor, reported that decreased mean blood loss (mean difference (MD) -80.52 mL, 95% confidence interval (CI) -96.39 to -64.65 mL; decreased PPH of at least 500 mL, There were no clear differences between groups in severe PPH of at least 1000 mL average RR 0.32, 95% CI 0.04 to 2.59.

Finding of the current study revealed that There was a statistical significant differences between both groups regarding to hospital stay, these finding are in the same line with, findings of the study carried out by Marshall, (2017) who explored the impact of postpartum hemorrhage on hospital length of stay and inpatient mortality, reported that Women with non-atomic postpartum hemorrhage had the highest average length of stay (3.67 days) followed by atomic postpartum hemorrhage (2.98 days) and non-postpartum hemorrhage (2.63 days) ; P <.001. In addition, the study findings of the current study are not congruent with the study findings conducted by Moudi, (2019) who investigated the causes of maternal death from postpartum hemorrhage in rural areas of Sistan and Baluchestan, Islamic Republic of Iran, They showed improvements in the use of intravenous fluid therapy, pulse and blood pressure checks, external uterine massage, and uterotonic drugs. Following training, more women were admitted to hospital in a stable condition and recovered and were discharged (P = 0.002), and fewer had surgical interventions (P = 0.007).

Finally, finding of the current study revealed that There was a statistical significant differences between both groups regarded to follow-up after discharge (p= 0.0001, 0.0001, & 0.0001 respectively) in uterine condition, amount of lochia & breastfeeding, the study findings of the current study are matched with the study findings conducted by Ajenge, (2020) who determine whether there is an effect of back massage on the decrease in the height of uterine fundus in primiparous normal postpartum mothers, back massage two times a day for 15 min. Height of uterine fundus was evaluated on day 1.4,7 using an observation sheet, reported that a p-value < 0.05, in the other hand, the study finding of the current study are disagreed with Yousuf, (2020) who assess Frequency, Management and Outcome of Postpartum Hemorrhage at a tertiary care Hospital, reported that frequency of PPH was 32.73 per 1000 deliveries, prevalence of primary PPH was 90.51%. Among the causes of PPH, Uterine atony was the leading cause 42/137 (30.65

VII. CONCLUSION
in conclusion, women who received the designed nursing clinical pathway were less likely to develop PPH than those who exposed to the routine hospital care, this improvement was decreased in amount of blood loss, stability in vital sign, improvement in uterine condition & consistency, and shortened length of hospital stay.

Recommendations
Based on the result of the present study, the researcher investigator was recommended:

1. Postpartum hemorrhage guidelines & protocols should be applied and used in maternity hospital.
2. Further studies using qualitative approach studying (the lived experience of women with PPH).
3. Replication of the study on a larger probability sample selected from different geographical areas in Egypt is recommended to obtain more generalization data.

Conflict of interest: the authors declare that there is no conflict of interest.

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