Original Article

Assessment of Utilisation of Non-Pneumatic Anti Shock Garment (NASG) in the Control of Post-Partum Haemorrhage among Midwives in Selected Hospitals in Ondo-State, Nigeria

Ohaeri, Beatrice M. RN, PHD
Senior Lecturer, Department of Nursing, University of Ibadan, Ibadan, Oyo State, Nigeria.

Ogbeye, Gbemisola Bolanle, RN, MSc
Senior Nursing Officer, Nursing unit, Directorate of Health Services, Federal University of Technology, Akure, Ondo State, Nigeria.

Correspondence: Gbemisola Ogbeye, Address Directorate of Health Services, Federal University of Technology, Akure, Ondo State, Nigeria. Email: sungbems2005@yahoo.com

Abstract

Background: The Non-Pneumatic Anti-Shock Garment (NASG) is a cost effective modern implement that had been found to be effective in the control of post partum haemorrhage.
Objective: This study seek to assess the utilization of Non-Pneumatic anti-shock garment among midwives working in the management of post partum hemorrhage in secondary and tertiary maternity health institutions in Ondo State.
Methodology: The study adopted a descriptive research design. The study was done in one tertiary and four secondary heaths institutions in the state. In all 177 midwives participated in the study. Systematic random sampling technique was used. Semi structured self administered questionnaire whose validity and reliability has been previously ascertain was the instrument used for data collection which took a period of 6 months. Descriptive statistic was used for data analysis.
Results: Most of the midwives studies were married. Academic qualifications of the respondents also revealed that vast majority are diplomate with only few having university degree. Study also shows gross unavailability of this garment in the centres was this study was conducted. Majority of the respondents do not have formal training on the use of anti shock garment. Majority want to be trained on the use of the garment and plead that it should be made available in all maternity centres in the state. Non availability of the garment was the major factor responsible for its low utilization.
Conclusion: The garment should therefore be made available in all health institutions offering maternity service, midwives and other health practitioners involved in the rendering maternity service should be trained on how to use this important garment in the management of post partum haemorrhage.

Key Words: Anti-Shock garment, Post Partum Haemorrhage, Utilization

Introduction

Postpartum hemorrhage (PPH) is the single chief cause of maternal death throughout the world (Mourad-Youssif, *et al*., 2010). These deaths are essentially preventable with skilled birth attendance and all-inclusive emergency obstetric care. While it is true that majority of maternal deaths from PPH occur in low income nations, PPH-related morbidity and mortality are rising in high income nations as well (Knight, *et al*., 2009). Evidence from World Health Organisation strongly submitted that deaths due to PPH were underestimated and could reach as high as 40% of all maternal morbidity in some African countries as well as South Africa, South East Asia, and Latin America. Indeed postpartum haemorrhage is the cause of close to 50% of maternal mortality in Guatemala and Afghanistan. It is a known fact that PPH can lead to death with few how if no appropriate medical intervention is done, WHO (2000) submitted that a woman suffering from PPH can die within 2 hours unless she receives immediate and appropriate medical care.

Administration of prophylactic uterotonics reduces the risk of atonic PPH by up to 60%

(Prendiville, Elbourne, McDonald, 2000; Derman, *et al*., 2006), women in thousands still experiences PPH, and die without rapid recognition and treatment. Also, not all uterine atony will respond to uterotonic treatment of PPH, and not all Obstetric Haemorrhage etiologies will respond to uterotonics.

When there is a delay in the management of PPH for whatever reason, first-aid is needed to resuscitate and stabilize women with hypovolemic shock until definitive treatment is obtained. One new low-technology first-aid device for stabilizing women suffering hypovolemic shock secondary to obstetric hemorrhage that can be used as first aid is the Non-Pneumatic Anti-Shock Garment (NASG). The Non-pneumatic Anti-Shock Garment is a first-aid, lower-body compression device made from neoprene and Velcro™ (Zoex Corporation, Ashland, OR, USA). According to Miller, Martin, Morris (2008) each of its nine segments is wrapped in sequence tightly around a hemorrhaging woman's legs, pelvis and abdomen. The abdominal segment applies extra compression with a small foam ball. The circumferential counter pressure applied by the NASG reduces the total vascular space in the lower portion of the body while at the same time increasing the volume of blood in the central circulation. This ensure that more oxygenated blood is shifted to the vital organs.

Therefore, the application of the NASG is capable of reversing the hemorrhagic shock and can stabilize a patient while awaiting transport, during transport, or during delays in receiving care at referral facilities. NASG is presently been used for women with postpartum haemorrhage from all etiology in many low-resource referral facilities.

NASG is a cost-effective intervention for referral hospitals (RH), based on report of studies in Egypt and Nigeria (Sutherland, *et al.,* 2013). Several policy initiatives, have been initiated over the past few decades to improve maternal health in many developing countries, hitherto these have not really change the poor maternal indices and health system level remains weak. For women in severe shock, with a mean arterial blood pressure (MAP) of less than 60 mmHg, use of the NASG improved health outcomes by averting 2–3 disability-adjusted life years (DALYs) per woman and had a net savings or extremely low cost per DALY averted.

Therefore, accessible health interventions, those that are effective and efficacious when applied to the larger population, are essential in reducing maternal mortalities and morbidities (Milat, King, Bauman, & Redman, 2012). Facts on cost-effectiveness is critical in planning scale-up and impact of maternal health interventions, but is often lacking (Milat, *et al.,* 2012; Hounton, & Newlands, 2012; Adam, *et al*., 2005).

Published papers have reported the utility of the NASG for women with obstetric hemorrhage from all etiologies in low-resource referral facilities (Brees, Hensleigh, Miller, Pelligra, 2004; Hensleigh, 2002; Miller, Hamza, Bray, Gipson, Nada, Fathalla, Mourad, 2006; Miller, *et al*., 2007; Miller, Ojengbede, Turan, Morhason-Bello, Martin, Nsima, 2009). Mourad-Youssif, *et al*., (2010) in an attempt to measure whether Non-pneumatic Anti-Shock Garment (NASG) reduce adverse maternal outcomes from postpartum haemorrhage, in an evidence from Egypt and Nigeria found out that measured blood loss reduced by half between phases; women experienced 400 mL of median blood loss after study entry in the pre-intervention and 200 mL in the NASG phase. They further submitted that mortality decreases from 9% pre-intervention to 3.1% in the NASG phase while severe morbidity decreased from 4.2% to 1%, in the NASG phase. In the same vain, they also found out that "adverse outcomes," decreased to 4.1% from 12.8% in the NASG phase. This is also similar to findings of El Ayadi, Butrick, Geissler, & Miller, 2013).

Kerr, Hauswald, Tamrakar, Wachter, & Baty, (2014) reported that all nurse and midwives that participated in their study believed in and accept the use anti shock garment in the management of obstetric hemorrhage and that they could make, clean, and apply it. They also added that the providers learned how to apply the device quickly, remembered how to apply it, and were willing and able to use the device clinically. Some of their respondents had used the device before, each on one patient, to treat obstetric hemorrhage after routine measures had failed with good clinical outcomes. It is therefore important to assess the utilization of this result proven anti shock garment among midwives that are directly saddled with the responsibility of attending to peri natal women. This study will also identify factors associated with it utilization or otherwise.

Methodology

This study adopted descriptive research design to assess utilization of anti shock garment in the management of post partum haemorrhage in selected hospitals in Ondo state. The study was carried among midwives in the obstetrics and gynaecology units of FMC Owo, Mother & Child Hospital Akure and State Specialist hospitals (Akure, Ondo, Ikare). A total of 177 midwives, out of the total 289 midwives, in the obstetrics and gynaecology units of the selected hospital whose consent had been previously sought and gained participated in the study.

A self structured questionnaire with predetermined validity and reliability was the instrument used for data collection. Data collected were analysed using statistical package for social sciences (SPSS) version 16. Ethical permission was collected from Ondo State Hospitals Management Board and Federal Medical Center, Owo.

Results

Socio demographic characteristics of the respondents showed that vast majority (76.8%) are married and diplomate with only 21.5% having university degree. The mean age of the respondents was observed to be 34.55±8.56 years, while the number of years that respondents have spent on the job revealed an average of 9.67±7.78 years.

Table 1: Midwives utilization of anti-shock garment

Variable	Label	Frequency (N = 177)	Percentage (%)
Having been trained on the use of anti-shock garment	Yes No	54 123	30.5 69.5
Interested on been trained on the utilization of the garment	Yes No Undecided	159 4 14	89.8 2.3 7.9
When the training was done	2003 2007 2008 2009 2010 2011 2012 Not applicable	3 1 1 1 10 5 15 14	1.7 0.6 0.6 0.6 5.6 3.9 9.1 79.7
Availability of anti-shock garment in the facility	Yes No	42 135	23.7 76.3
Utilization of anti-shock garment	Yes No	25 152	14.1 85.9
How long the anti-shock garment has been in use in years	1 2 3 Not applicable	10 6 2 159	5.6 3.4 1.1 89.8
Level of effectiveness of the garment	Not effective Averagely effective Very effective Not applicable	3 4 13 157	1.7 2.2 7.4 88.7
The garment should be a must in every health care facility that has maternity service	Yes No Undecided	165 2 10	93.2 1.1 5.6

Table 2: Factors responsible for non utilization of the garment

Factors	Frequency	Percent
Availability of other ways of treating PPH	1	0.6
Effective management of 3rd stage of labour	1	0.6
Inexperience on the part of health worker	3	1.7
Lack of fund	1	0.6
Lack of skilled personnel	1	0.6
Non availability of the garment	62	35.0
Not aware of the garment existence	6	3.4
The garment is not convenient	3	1.7
Do not know	99	55.9

Availability of anti shock garment in the selected hospital showed that it is only 23.7% said anti shock garment is available in their facility.

Findings also showed that only 54 (30.5%) had formal training on the use of anti-shock garment. Vast majority of the respondents 159 (89.8%) are interested on been trained on the use of anti-shock garment, for majority of the midwives that has been trained on the use of this garment, the training was in the last 5 years.

Only 14.1% of the midwives utilize the garment when the need arise, while for majority of the respondents the use of the garment is the last one year. majority of the midwives that have used the garment opined that the garment is effective. Vast majority of the respondents' advocate that the garment should be made available in all facilities that offers maternity services.

Perceived factors responsible for non utilization of anti garment, showed that non availability of the garment (35%) is the main hindrance, others hindrances mentioned include availability of other ways of treating PPH (0.6%), effective management of PPH (0.6%), inexperience on the part of the health worker (1.7%) lack of fund (0.6%), lack of skilled personnel (0.6%), not been aware of the existence of the garment (3.4%) while 3 (1.7%) opined that it is not convenient.

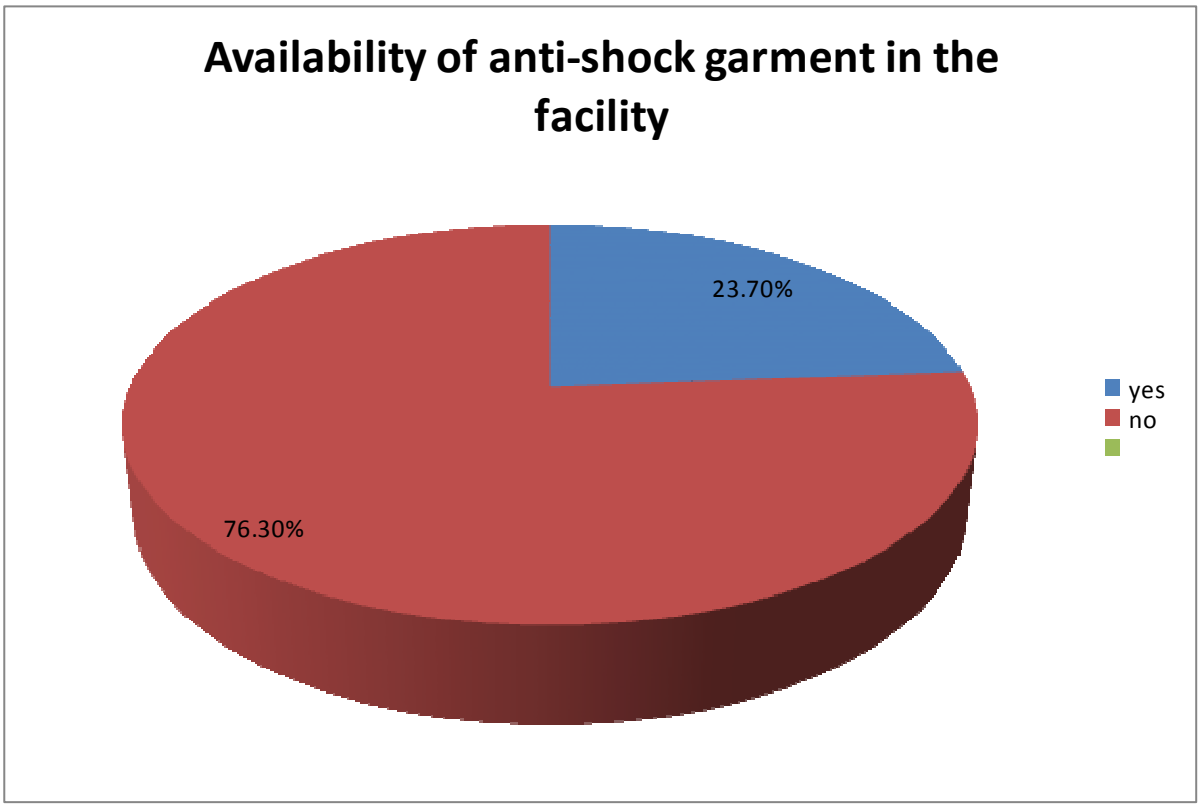

Figure 1: Availability of anti-shock garment in the facility

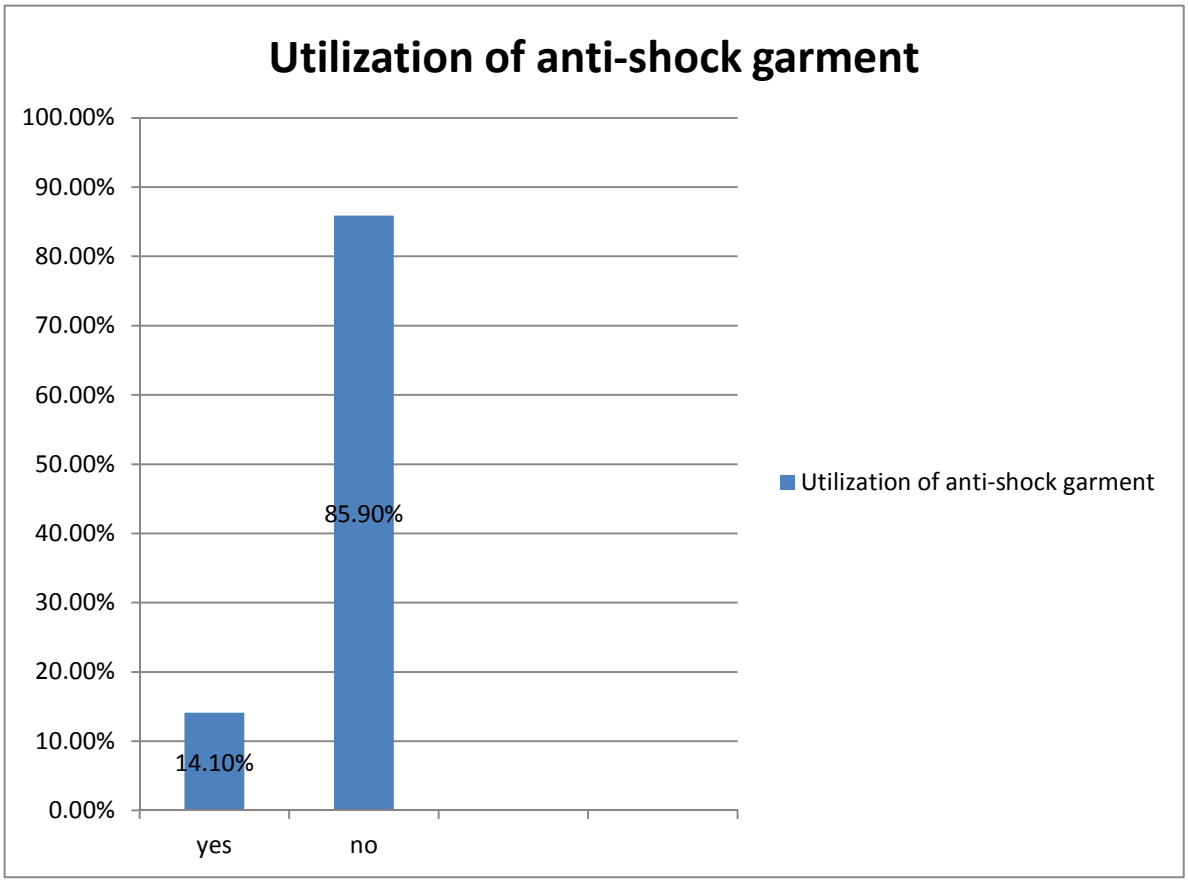

Figure 2: Midwives Utilization of anti-shock garment

Discussion

This study showed that midwives in the hospital understudy were still largely at the diplomate level of nursing education. This might also not be different from what will be obtainable in making health care institution in Nigeria where nursing education is still largely hospital based diploma schools. About one fifth of the respondents that had university level of education is commendable and shows a huge improvement about what the statistics had been in the past. The mean number of years that the respondents had spent on the job from the result of the study shows that midwives that participated in the study have a wealth of experience which made them suitable for the study.

Availability of the Non-Pneumatic Anti-Shock Garment for use in the hospital according to the midwives in this study was very low. It is very unfortunate that despite poor maternal indices in Nigeria and Ondo State having one of the worst in the Western part of the country, this essential tool is not available. Despite numerous reported efficacy of this tool and its utilization in many other countries especially developing countries with high maternal mortality (Brees, *et al.*, 2004; Hensleigh, 2002; Miller, *et al.*, 2006; Miller, *et al.*, 2007; and Miller, *et al.*, 2009).

Only about one third of the midwives that participated in this study have had training on the utilization of Non-Pneumatic Anti-Shock Garment before, this shows that only few midwives that can use the garment, although vast majority of the midwives are willing to go for the training if they have the opportunity, Kerr, *et al*,, (2014), in a study in Nepal emphasised the importance of training for nurses and midwives for effective utilization of NASG. Among the participants that have had training of NASG majority had the training in the within the last five years.

Only 14.1% of the participants had used NASG before with over whelming majority of them confirming its effectiveness in the control of post partum haemorrhage. Sutherland, *et al.*, (2013) in a study in Egypt and Nigeria confirm the effectiveness NASG in the management of post partum haemaorrahe. Results of this study also

confirm the submissions of Mourad-Youssif, *et al.*, (2010) when they reported that NASG reduces the adverse maternal outcomes from postpartum haemorrhage. Similar position was also asserted by El Ayadi, *et al*., (2013) in their systemic review of five quasi-experimental studies that tested the NASG as treatment for hypovolemic shock secondary to obstetric hemorrhage at the tertiary care facility level.

Non availability of the garment at the facility level was the highest mentions factors militating against the use of the garment as mentioned by the midwives that participated in the study. This unavailability of the garment in many of the facilities understudied might be due to the high cost of garment, although the cost of the garment cannot be compared to the cost of losing a life. Also this study was carried out in secondary level of health care with availability of other mean controlling post partum haemorrhage and highly skilled health professionals to attend to women during delivery. The garment is made to be used essentially in primary level of health care where there are limited resources both material and human to manage post partum haemorrhage, so that the patients can be transported safe to higher level of health care.

Conclusion

Utilization of the garment for the management of post partum haemorrhage was very poor and this was as a result of non availability of this garment which leads to its poor utilization. The garment should therefore be made available in all health institutions offering maternity service, midwives and other health practitioners involved in the rendering maternity service should be trained on how to use this important garment in the management of post partum haemorrhage.

References

Adam, T., Lim, S.S., Mehta, S., Bhutta, Z.A., Fogstad, H., Mathai, M., … Darmstadt, G. L. (2005). Achieving the millennium development goals for health: Cost effectiveness analysis of strategies for maternal and neonatal health in developing countries, *Br Med J. 7525*(1107).

Brees, C., Hensleigh, P.A., Miller, S., & Pelligra, R. (2004). A non-inflatable anti-shock garment for obstetric hemorrhage. *Int J Gynaecol Obstet*, *87*,119-124.

Derman, R.J., Kodkany, B.S., Goudar, S. S., Geller, S. E., Naik, V.A., Bellad, M.B., ... Moss N. (2006). Oral misoprostol in preventing postpartum haemorrhage in resource-poor communities: A randomised controlled trial. *Lancet*, *368*(9543), 1248-1253.

El Ayadi, A. M., Butrick, E., Geissler, J., & Miller, S. (2013). Combined analysis of the non-pneumatic anti-shock garment on mortality from hypovolemic shock secondary to obstetric hemorrhage. *BMC Pregnancy and Childbirth*, *13*, 208. available at http://www.biomedcentral.com/1471-2393/13/208

Hensleigh, P.A. (2002). Anti-shock garment provides resuscitation and haemostasis for obstetric haemorrhage. *BJOG*, *109*, 1377-1384.

Hounton, S., & Newlands, D. (2012). Applying the net-benefit framework for analyzing and presenting cost-effectiveness analysis of a maternal and newborn health intervention. *Plos one*, *7*(7), e40995.

Kerr, N. L., Hauswald, M., Tamrakar, S. R., Wachter, D. A., & Baty, G. M. (2014). An inexpensive device to treat postpartum haemorrhage: a preliminary proof of concept study of health provider opinion and training in Nepal. *BMC Pregnancy and Childbirth*, *14*(81).

Knight, M., Callaghan, W.M., Berg, C., Alexander, S., Bouvier-Colle, M., Ford, J. B. …Walker, J. (2009). Trends in postpartum haemorrhage in high resource countries: A review and recommendations from the International Postpartum Haemorrhage Collaborative Group. *BMC Pregnancy and Childbirth*, *9*.

Milat, A.J., King, L., Bauman, A.E., & Redman, S. (2012). The concept of scalability: Increasing the scale and potential adoption of health promotion interventions into policy and practice. *Health Promot Int*,

Miller, S., Hamza S., Bray, E., Gipson, R., Nada, K., Fathalla, M.F., & Mourad, M. (2006). First Aid for Obstetrical Haemorrhage: The Pilot Study of the Non-pneumatic Anti-Shock Garment (NASG) in Egypt. *BJOG*, *113*,424-429.

Miller, S., Martin, H.B., & Morris, J.L. (2008). Anti-shock garment in postpartum haemorrhage. *Best Pract Res Clin Obstet Gynaecol*, *22*, 1057-1074.

Miller, S., Ojengbede, O., Turan, J.M., Morhason-Bello, I.O., Martin, H.B., & Nsima, D. (2009). A comparative study of the non-pneumatic anti-shock garment for the treatment of obstetric hemorrhage in Nigeria. *Int J Gynaecol Obstet*, *107*, 121-125.

Miller, S., Turan, J., Dau, K., Fathalla, M., Mourad, M., Sutherland, T., ... Gipson, E. (2007). Use of the non-pneumatic anti-shock garment (NASG) to reduce blood loss and time to recovery from shock for women with obstetric haemorrhage in Egypt. *Global Public Health*, *2*,110-124.

Mourad-Youssif, M., Ojengbede, O. A., Meyer, C. D., Fathalla, M., Morhason-Bello, O. I., Galadanci, H., … Miller, S. (2010). Can the Non-pneumatic Anti-Shock Garment (NASG) reduce adverse

maternal outcomes from postpartum hemorrhage? Evidence from Egypt and Nigeria. *Reproductive Health*, *7*(24). Available at http://www.reproductive-health-journal.com/content/7/1/24

Prendiville, W.J., Elbourne, D., McDonald, S. (2000). Active versus expectant management in the third stage of labour. *Cochrane Database Syst Rev*, 3:CD000007.

Sutherland, T., Downing, J., Miller, S., Bishai, D.M., Butrick, E., Fathalla, M.M., … Kahn, J. G. (2013). Use of the non-pneumatic anti-shock garment (NASG) for life threatening obstetric haemorrhage: A cost-effectiveness analysis in Egypt and Nigeria. *PloS one*, *8*(4), e62282.

WHO, (2000). Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors. Integrated Management of Pregnancy and Childbirth (IMPAC) Geneva: WHO, Department of Reproductive Health and Research 2000.