A New Tool for Saving Women's Lives in Nigeria: The Potential of the Non-pneumatic Anti-Shock Garment

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Panel Discussion 3446 - Monday 5 November 2007, 8:30pm

Global Experiences with the Non-pneumatic Anti-Shock Garment: A New First Aid Device for Saving Mothers' Lives from Obstetric Hemorrhage

American Public Health Association
135th Annual Meeting
November 3-7, 2007
Washington, DC

This work was funded by the John D. and Catherine T. MacArthur Foundation

Maternal Mortality and Obstetric Hemorrhage in Nigeria

- Nigeria's MMR is 800/ 100,000 live births[1]
- Obstetric hemorrhage causes at least 25% of those deaths
- Most deaths are attributable to some form of delay

* WHO, UNICEF& UNFPA, 2004.

The NASG in Nigeria

- Piloted initially in 4 hospitals
- Expanded pilot studies to 6 hospitals in 2005
- Currently being pilot tested in 12 hospitals and 10 Primary Health Care Centers
- Around ***400*** Nigerian women with obstetric hemorrhage have been treated with the NASG to date

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Preliminary Pre-Post Data from six Nigerian Hospitals (n=260)

- 2 hospitals in Northern Nigeria (Kano)
- 4 hospitals in Southern Nigeria (Ibadan & Lagos)
- Total of:
  - 99 pre cases
  - 161 NASG cases

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Real Conditions at Hospitals in Low-Resource Settings

- Overly busy
- Understaffed
- Under-equipped
- Facility closures
- LACK OF BLOOD FOR TRANSFUSIONS
- Women often arrive at the referral center in moribund conditions

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Study Entry Criteria

- Women suffering from severe obstetric hemorrhage with hypovolemic shock

Characteristics of Women with Obstetric Hemorrhage & Shock

	Pre-NASG (n=99)	*NASG (n=161)*	*Statistical test result*
Mean age +/- SD (N=259)	29.86 ± 6.50	29.86 ± 5.59	t-test, ns
Mean duration of pregnancy +/- SD (N=203)*	37.13 ± 3.39	37.05 ± 2.90	t-test, ns

* Excluding those with complications of abortion, ectopics, and molar pregnancies

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Condition at Study Entry

	Pre-NASG (n=99)	*NASG (n=161)*	*Statistical test result*
Median estimated blood loss in mL* (range) (N=232)	1000 (200-3000)	1600 (100-3000)	Median difference = -500, p < .05 (95% CI: -250 to -500)
Women with non palpable pulses, n (%) (N=260)	10 (10·1%)	60 (37.3%)	X^2 = 22·99, p=·000

* Only for those with external blood loss at study admission

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Standard protocols for the treatment of hemorrhage and shock

- Administration of crystalloid intravenous fluids
- Determine the source of bleeding
- If uterine atony
  - Use of uterotonic medications
  - Uterine massage
- Providing blood transfusions, vaginal procedures, and/or surgery as necessary

Treatment Received

	Pre-NASG (n=99)	*NASG (n=161)*	*Statistical test result*
Women receiving ≥1500 mL of **IV fluids** in 1st hour, n (%) (N=250)	59 (65·6%)	97 (60·6%)	Chi-square, ns
Women who received a **blood transfusion**, n (%) (N=250)	79 (87·8%)	145 (90·6%)	Chi-square, ns
Women with uterine atony who received **uterotonics**, n (%) (N=67)	26/26 (100·0%)	37/41 (90·2%)	Chi-square, ns
Women undergoing an **operation** (surgery), n (%) (N=257)	35 (35·7%)	51 (32·1%)	Chi-square, ns

Outcomes

	Pre-NASG (n=99)	*NASG (n=161)*	*Statistical test result*
Median blood loss measured in the drape (mL, range) (N=164)*	600 (0-2500)	230 (0-800)	Median difference = 400, p < .05 (95% CI: 250 – 520)
Mortality, n (%) (N=259)	7 (**7·1%**)	10 (**6·2%**)	RR = 0·870 (95% CI: 0·342 – 2·210) ns
Morbidity, n (%) (N=242 woman who survived)	3 (**3·3%**)	1 (**0·7%**)	Chi-square, ns

* 94 pre-NASG cases and 70 NASG cases

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Conclusions I

- The findings of this pilot are similar to the findings of the previously published Egypt NASG pilot study.[1]
- In both studies the median blood loss measured in the drape was significantly lower in the NASG group, 62% less in Nigeria and 50% less in Egypt.
- Proportions with MORBIDITY or MORTALITY were lower in the NASG group in both Egypt and Nigeria, but not statistically significant.

* Miller, SM et al., *BJOG;* 2006; 113(4):424-9.

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Conclusions II

- NASG *significantly* decreases blood loss.
- NASG *may* decrease morbidity and improve survival among women suffering severe hypovolemic shock secondary to obstetric hemorrhage in low-resource settings such as Nigeria.
- We are still collecting and analyzing data in Nigeria (expected N=585), with results to be presented soon.

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Acknowledgements

Our Partners:

MacArthur
The John D. and Catherine T. MacArthur Foundation

University Of Ibadan

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Participating Hospitals:

- Ayinke House Maternity Hospital, Lagos
- University College Hospital, Ibadan
- Aminu Kano Teaching Hospital, Kano
- Murtala Mohammed Specialist Hospital, Kano
- Adeoyo Maternity Hospital, Oyo State
- Lagos Island Maternity Hospital

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