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31 The ghana randomized air pollution and health study (GRAPHS): A cluster-randomized trial of clean cookstoves to improve obstetric outcomes



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OBJECTIVE: Low birth weight (LBW) accounts for 60-80% of all neonatal deaths worldwide, with over 95% of LBW infants born in developing countries. Prenatal cook smoke exposure from inefficient burning of biomass fuels (wood, hay) has been linked with LBW and stillbirth; almost half of the world's population uses these fuels. Policy efforts are underway to scale up clean cooking technologies globally but evidence that their introduction improves obstetric health is lacking. Our objective was to evaluate whether introducing clean cookstoves in pregnancy improves birth weight and other obstetric outcomes.

STUDY DESIGN: Pregnant women with singletons were enrolled from 35 Ghanaian community clusters into GRAPHS prior to 28 weeks and randomly assigned to cook with traditional fires, improved wood burning stoves (BioLite), or liquefied petroleum gas (LPG) stoves. Randomization to the three arms occurred at the cluster level with clusters balanced by sociodemographic and other key variables. Gestational age was established by ultrasound at enrolment. Weekly community-based field worker visits documented stove use compliance. Personal exposure to carbon monoxide was measured at repeated intervals. Newborn weight was measured with calibrated digital scales. Outcomes were compared by arm using multilevel regression models to account for clustering.

RESULTS: Of 1714 pregnant women screened from 09/13 to 06/15, 1414 were randomized to traditional fires (n=526), BioLite stoves (n=527), or LPG stoves (n=361). 78 participants miscarried or were lost to followup; 33 had stillbirths. In unadjusted intention-to-treat analysis for live births, birth weight did not differ for women using BioLite or LPG stoves compared to traditional fires (p=0.49 and 0.68)(Table). Secondary outcomes also did not significantly differ for either intervention versus control. Stillbirths were less frequent for LPG (6/346, 1.7%) compared with traditional fires (15/490, 3.1%) but did not reach significance (OR 0.6; 95%CI 0.2-1.5).

CONCLUSION: A strategy of providing improved cook stoves or fuels to individual pregnant women prior to 28 weeks does not improve mean birth weight or other obstetric outcomes in this rural African population. Clean energy may need to be provided to clusters or entire communities in order to achieve improvements in pregnancy health.

Obstetric outcomes for singleton live births in GRAPHS.			
	Control arm	BioLite arm	LPG arm
	n=475	n=488	n=340
Primary Outcome			
Birth weight	2890 (± 490)	2920 (± 460)	2870 (± 490)
Secondary Outcomes			
Low birth weight	83 (17.7%)	77 (15.9%)	59 (17.4%)
Preterm birth	24 (5.1%)	17 (3.5%)	17 (5.0%)
Small for gestational age	99 (21.1%)	103 (21.3%)	75 (22.1%)



Left panel- traditional 3-stone fire; middle panel- BioLite stoves; right panel- LPG stove

32 Reduction of total labour length through the addition of parenteral dextrose solution in induction of labor in nulliparous: Results of DEXTRONS prospective randomized controlled trial



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OBJECTIVE: Prolonged labour is a significant cause of maternal et foetal morbidity. Optimal uterine muscle function is critical to efficient active second stage of labour. The physiology of skeletal muscle suggests that glucose supplementation might improve muscle performance. The goal of our study was to provide reliable evidence as to whether IV glucose supplementation during labour induction in nulliparous women can reduce total duration of active labour.

STUDY DESIGN: We performed a prospective triple-blinded randomized-controlled trial investigating the use of parenteral IV of dextrose 5% with normal saline versus normal saline in 190 induced-nulliparous women. Inclusion criteria were monofoetal pregnancy at term with cephalic presentation and favourable cervix. After informed consent, patients were randomly assigned to receive either 250 mL/hour of IV dextrose 5% with normal saline or 250 mL/hour of normal saline for the whole duration of induction, labour and delivery. The primary outcome studied was the total length of active labour. Secondary outcomes include duration of second active stage of labour, mode of delivery and newborn APGAR score.

RESULTS: The duration of first and second stage of labour were significantly reduced in the dextrose group (441 versus 505 minutes,