

Title:

Implementation of a training program for the intraoperative use of Hemafuse, a whole blood autotransfusion device for ruptured ectopic pregnancy in Ghana and Kenya.

Authors:

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Background:

Transfusion of blood products is essential for emergency treatment of life-threatening hemorrhagic conditions including ruptured ectopic pregnancy. Lack of timely access to blood contributes to maternal mortality, especially in Sub-Saharan Africa countries where women usually present late and with severe hemodynamic compromise. Furthermore, constraints in the frail blood banking systems put pregnant patients at greater risk. Autologous blood transfusion has proven to be an effective alternative for immediate transfusion. A novel device, Hemafuse, was developed to perform life-saving, intraoperative whole blood autotransfusion. A training program on the device was implemented for local operative theatre personnel in Ghana and Kenya.

Methods:

The training program consisted of a 2-hour session to learn about proper indications for use, assembly, operation and troubleshooting; with a standardized training curriculum that included presentations, simulation training and evaluation. Hemafuse champions were identified during training sessions to lead the usage of the device at their local healthcare facility. Training teams consisted of operative theatre personnel directly involved in the management of patients with potential risk of intraoperative bleeding. Stakeholders across Ghana and Kenya were invited to the training sessions. The targeted stakeholders included; operating theatre nurses, surgeons, anesthesiologists and surgical assistants. Clinical champions were surveyed about each ectopic pregnancy case in which Hemafuse was used regarding the team involved and the estimated amount of blood salvaged. Questionnaires were delivered via email or in person depending on local resources.

Findings:

The training program was conducted at 32 healthcare facilities in Kenya and 4 in Ghana. Implementation of the training program in Kenya began on August 31, 2018 and in Ghana on December 10, 2019 with outcomes monitored over a three-year period. Scrub nurses, anesthesiologists, and obstetrician and gynecologists accounted for 75% of the personnel trained. Hemafuse champions from 21(58%) hospitals reported device usage in 127 ruptured ectopic pregnancy cases between October 2018 and September 2021. The median estimated amount of blood salvaged was 575mL per case (IQR:400-900mL). Scrub nurses were part of the team that operated the device in 28(22%) of the cases, anesthesiologist 23(18%), OBGYN

7(5.5%) and medical officers 43(34%). Multiple users were observed by champions in all the cases.

Interpretation

Implementation of this training program empowered local hospital champions to safely conduct life-saving intraoperative transfusions, especially where timely access to banked blood products was absent or not immediately available. Hemafuse champions were able to lead emergency use of the autotransfusion device salvaging up to 900mL of whole blood per case.

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