

Four-year outcomes of routine use of cell salvage in a tertiary obstetric centre: A practice evaluation

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Introduction:

Haemorrhage remains a leading cause of maternal death and therefore optimal management is integral to good obstetric care (1). Blood transfusion is often used to to treat major haemorrhage in obstetrics with complications rarely occurring in the current day (2). However, it is not without risk. ABO mismatch and blood borne infections still exist and donor blood remains a scare resource. Some women also choose to decline blood transfusion (3). An alternative to donor blood transfusion is intraoperative cell salvage (IOCS) with autologous blood transfusion (4). There is some reservation regarding the routine use of IOCS due to the perceived risk of alloimmunisation and amniotic fluid embolism (5, 6). This retrospective cohort study evaluates the routine use of IOCS in a tertiary obstetric centre over 4 years. It examines the rates of isoimmunisation in subsequent pregnancies as well as maternal and fetal complications.

Methods:

All women undergoing C section between 01 December 2014 and 31 November 2018 in a tertiary obstetric unit were included in the study. Data held on a maternity information system (MIS) were used to identify those delivered by C section and data was collected retrospectively. Due to the routine use of IOCS, all women who had a C section during the data collection period were included. Women undergoing a pregnancy subsequent to index cell salvage re-infusion were identified through the MIS. Any subsequent pregnancy up to 1st November 2022 was included within the study. Maternal group and antibody status at registering of the subsequent pregnancy were reviewed and compared to those at index delivery to establish new onset development of antibodies. Shapiro-Wilk tests were used to assess normality. Mann-Whitney U test was used to investigate whether there was a significant difference in blood volumes between individuals having reinfusion of salvaged blood only compared to those having reinfusion of salvaged blood and additional donor blood.

Results:

Between December 2014- November 2018, 6656 caesarean sections were performed at our centre. IOCS was routinely set up for all cases. A flow chart of eligible patients can be seen in Figure 1. Of these patients, 436 (6.6%) received reinfusion of salvaged blood at index delivery. Table 1 shows cell salvage reinfusion data at index delivery. No amniotic fluid embolisms secondary to reinfusion were reported. 0.7% of women required donor blood products perioperatively (Table 2).

Table 2 Transfusion of blood products at index delivery					
Year* n= C sections	2015 n= 1541	2016 n= 1612	2017 n= 1730	2018 n= 1652	
Number of women having salvage blood infused	82	51	168	126	
Number of reinfused women having donor RBC† reinfusion	11	2	15	21	
Total RBC units reinfused	35	6	37	92	
Number of reinfused women having fresh frozen plasma reinfused	4	1	8	13	
Total units of fresh frozen plasma reinfused	18	10	24	70	
Number of reinfused women having cryoprecipitate	0	1	0	4	
Total units of cryoprecipitate reinfused	0	4	0	7	
Number of reinfused women having platelet transfusion	0	1	3	4	
Total units of platelets transfused	0	6	4	6	
* For 2014 1 month (December) was included. In 2018 11 months were included (January-November), 2014 is not included in the table as no donor blood products were used.					
† RBC = Red blood cell					

Table 1 Reinfusion data at index delivery (n=436).	
Variable	
Estimated blood collected in reservoir (ml)†	1074ml±46ml
Reinfused volume (ml)	397ml±15ml
Haematocrit of processed blood (%)‡	45±0.3
Total estimated blood loss at index delivery (ml) §	1450ml±46ml
*All values represent mean and standard error of mean	
†For estimated blood collected in reservoir 7 patients had missing data (n=429)	
‡For haematocrit of processed blood 18 patients had missing data (n=418)	
§For total estimated blood loss at index delivery 7 patients had missing data (n=429)	

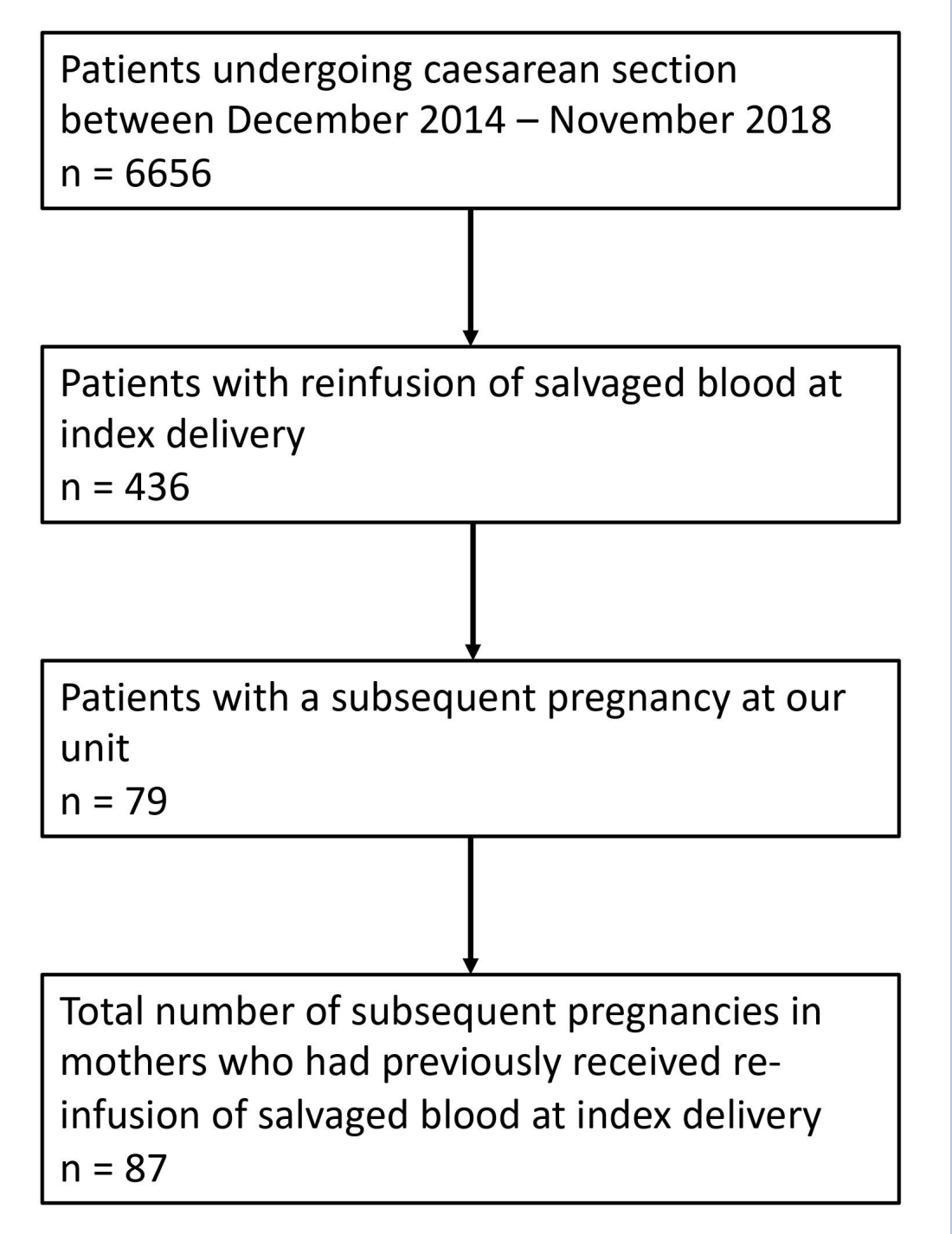


Figure 1. Flowchart of eligible patients

Of those who received reinfusion of salvaged blood, 79 (18.1%) patients had subsequent successful pregnancies over the up to 8-year follow-up period. There was one case (0.23%) of fetal-cell alloimmunisation demonstrated by the presence of anti-D antibodies on the subsequent pregnancy booking bloods. Due to rising anti-D titre and risk of haemolytic disease of the fetus and newborn, this baby was delivered at 36 weeks gestation in a good condition.

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