Can blastocyst percentage of re-expansion after warming be used to predict implantation potential and live birth outcome?

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Introduction

The ability of the blastocoel to re-expand after warming appears to be an indicator of embryo survival, implantation and live birth potential.[1,2]

Aim

To corroborate if there is a correlation between blastocyst re-expansion after warming, implantation and live birth.

Materials and methods

In a blind, retrospective study over four years the re-expansion rates of 703 blastocysts were analysed. All embryos had a known implantation data (KID), i.e. the number of transferred embryos matched the number of foetal hearts. Of the 703 embryos, 242 were KID+ vs. 461 KID-. Of these, 164 resulted in live birth (LB) vs. 483 LB negative. Blastocysts were warmed using Kitazato Vitrification media and placed into a time-lapse incubator. Blastocyst diameter was measured post-warming at times 0 and 90 minutes. The percentage of re-expansion was calculated for each blastocyst at a time interval of 0-90 minutes. All significance tests were two-tailed and conducted at a 0.05 significance level.

Results

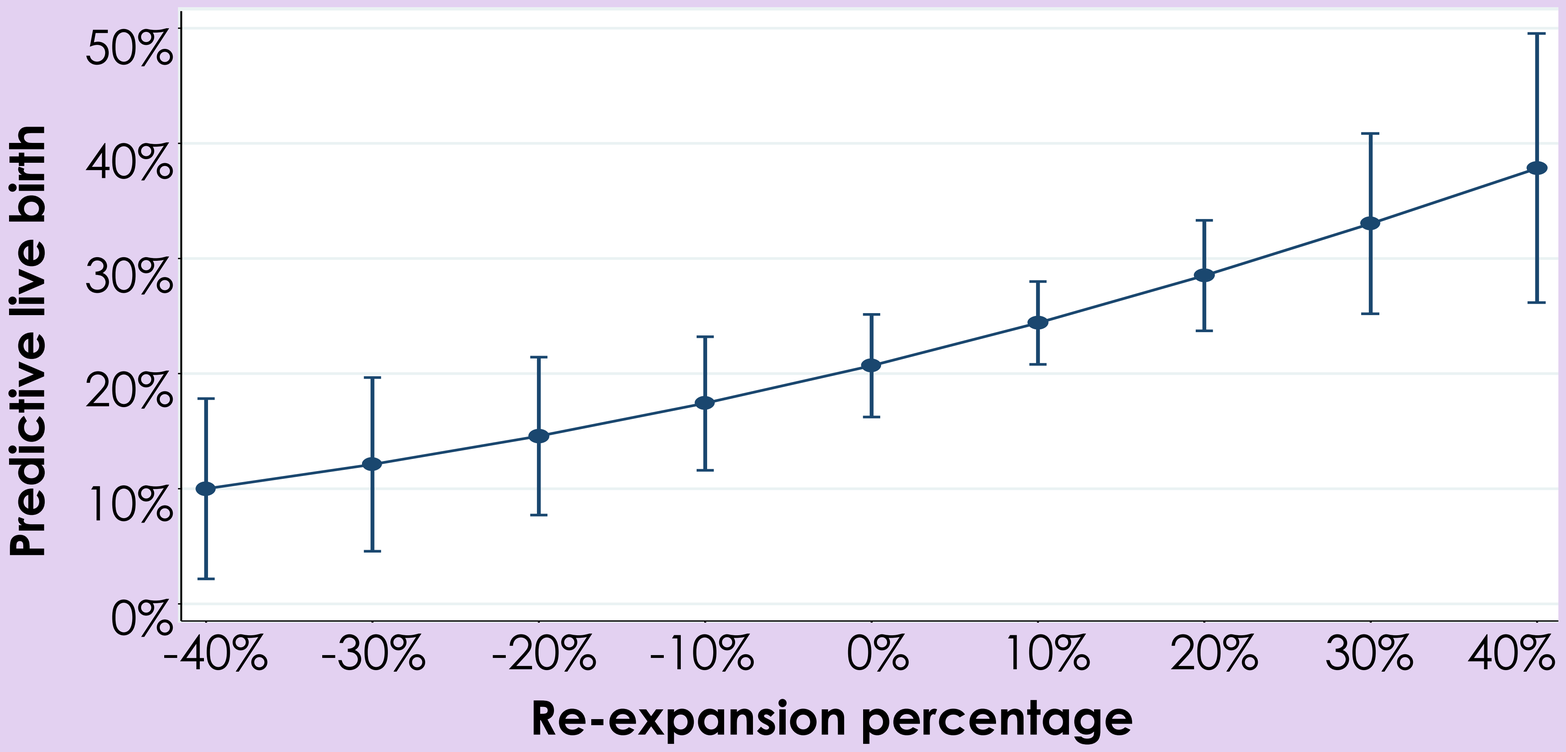
	KID +	KID -	p value	LB+	LB -	P value
Diameter at 90min (mm)	133.23*	128.17	>0.05	133.83*	128.17	>0.05
Percentage of re-expansion (%)	10.44	7.35	>0.05	11.52*	7.48	>0.05

Table 1. Shows diameter at 90 min and percentage of re-expansion 0-90min being statistical significant for blastocyst KID+ and LB + vs. KID – and LB-.

A logistic regression analysis for LB prediction has shown significant effect of age of the patient, mean blastocyst diameter and percentage of re-expansion.

A post-regression estimation analysis showed that a minimum of 20% re-expansion at 90 minutes is required for optimum LB above 25%, progressively increasing the greater the re-expansion.

Predictive live birth by embryo re-expansion percentage



Conclusions

This study demonstrated that blastocyst diameter measurements and percentage of re-expansion post-warming at 90 minutes are significantly correlated with implantation and LB outcomes. The use of a predictive model that correlates the blastocyst percentage of re-expansion post-warming and LB could be used as a tool to make clinical decisions.

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1. Ahlström *et al.* 2013; 2. Coello *et al.* 2017