

CHLOE-EQ Score: a novel biomarker of embryo viability

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Background

- Artificial Intelligence (AI) based tools have promised to improve embryo viability prediction
- There is a need to validate these promises before introducing AI technologies into clinical practice
- The objective was to validate the ability of CHLOE-EQ to predict embryo utilisation, decision for transfer, ploidy and clinical pregnancy

Methods

- CHLOE EQ score combines morphological and morphokinetic AI algorithms, trained on over 100,000 embryo videos, to assist in embryo selection
- 8368 embryos were cultured in embryoscopes across four different clinics: clinic 1 (n=362), clinic 2 (n=5591), clinic 3 (n=653), clinic 4 (n=1762)
- Efficacy of prediction of CHLOE-EQ score for embryo utilisation, decision for transfer, ploidy and clinical pregnancy for each individual clinic was assessed using Binary logistic regression and quantified using the area under the curve (AUC)

Results

		AUC					
		Overall	Clinic 1	Clinic2	Clinic 3	Clinic 4	
<ul style="list-style-type: none"> CHLOE-EQ score was predictive of <ul style="list-style-type: none"> embryo utilisation decision for transfer ploidy & clinical pregnancy 	CHLOE EQ	Embryo utilization	0.89 ±0.01	0.90	0.88	0.88	0.96
		Decision for transfer	0.75 ±0.12	0.64	0.72	0.89	0.81
		Ploidy			0.60		
		Clinical pregnancy			0.72		
<ul style="list-style-type: none"> CHLOE BLAST score was predictive of <ul style="list-style-type: none"> blastulation & decision for transfer. 	CHLOE BLAST	Blastulation	0.88 ±0.02	0.91	0.87	0.87	0.92
		Decision for transfer prediction	0.86 ±0.08	0.91,	0.9	0.76	0.74
<ul style="list-style-type: none"> CHLOE RANK was predictive of utilisation 	CHLOE RANK	Embryo utilization	0.88 ±0.01	0.89	0.92	0.82	0.81

- There was no significant difference in the efficacy of prediction between the different clinics for CHLOE EQ, CHLOE BLAST or CHLOE RANK (p>0.05)

Conclusion

CHLOE-EQ is consistently predictive of embryo viability across different clinics, suggesting that CHLOE-EQ could be a valuable biomarker to support clinical decisions regarding transfer, cryopreservation or discarding