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ELECTRE TRI-C, a multiple criteria decision aiding sorting model applied to assisted reproduction

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ABSTRACT

Objective: The aim of this paper is to apply an informatics tool for dealing with a medical decision aiding problem to help infertile couples to become parents, when using assisted reproduction.

Methods: A multiple criteria decision aiding method for sorting or ordinal classification problems, called ELECTRE TRI-C, was chosen in order to assign each couple to an embryo-transfer category. The set of categories puts in evidence a way for increasing the single pregnancy rate, while minimizing multiple pregnancies. The decision aiding sorting model was co-constructed through an interaction process between the decision aiding analysts and the medical experts.

Results: According to the sample used in this study, the ELECTRE TRI-C method provides a unique category in 86% of the cases and it achieves a sorting accuracy of 61%. Retrospectively, the medical experts do agree that some of their judgments concerning the number of embryos to transfer back to the uterus of the woman could be different according to these results. The current ART methodology achieves a single pregnancy rate of 47% and a twin pregnancy rate of 14%. Thus, this informatics tools may play an important role for supporting ART medical decisions, aiming to increase the single pregnancy rate, while minimizing multiple pregnancies.

Limitations: Building the set of criteria comprises a part of arbitrariness and imperfect knowledge, which require time and expertise to be refined. Among them, three criteria are modeled by means of a holistic classification procedure by the medical experts.

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