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Original Article

Do poor responders have poor perinatal outcomes? A retrospective analysis of 1386 assisted reproductive technology cycles

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ABSTRACT

Objective: The purpose of this study was to evaluate whether poor responder women have adverse perinatal outcomes compared to normo responders following assisted reproductive technology (ART).
Methods: A retrospective cohort study was conducted in a university level infertility unit between January 2010 to December 2015. Women undergoing fresh IVF cycles were included. Poor responders (≤3 oocytes) and normo responders (4–15 oocytes) were analyzed. Perinatal outcomes such as preterm birth (PTB), low birth weight (LBW), early preterm birth (early PTB) and very low birth weight (very LBW) were recorded.
Results: A total of 1386 ART cycles were analyzed. Final analysis included 40 and 318 live births in poor and normo responders respectively. The risk of PTB (30.3% vs. 24.8%; OR 1.32, 95% CI: 0.59–2.9), LBW (33.3% vs. 20.1%; OR 1.99, 95% CI 0.90–4.4), early PTB (3% vs. 2.2%; OR 1.40, 95% CI 0.16–12.4) and very LBW (3% vs. 1.8%: OR 1.72, 95% CI 0.19–15.9) were not significantly different between poor and normo responders. The subgroup analysis within poor responders did not show any significant difference in perinatal outcomes in women aged less and more than 35 years.
Conclusion: The current study findings suggest no increased risk of adverse perinatal outcomes in poor responders compared to normo responders following ART. These findings need to be further validated by larger studies.

1. Introduction

Poor responders in *in vitro* fertilization (IVF) remain a challenging group to treat in infertility practice, even though substantial research has been done and various treatment options such as androgen supplementation, addition of growth hormone and mild stimulation protocols [1,2] have been explored . The prevalence of poor ovarian response is 5.6–35.1% in women undergoing IVF [3–6]. The live birth rate in poor responders following IVF is between 9.9% and 23.8% [7,8]. This wide variation in live birth rate is because of the different criteria for poor responders in different studies [3–6]. The Society of Assisted Reproductive technology registry data has shown that at least half of the cancelled IVF cycles were due to poor ovarian response [9].

The existence of numerous definitions of poor responders has led to difficulty in investigating the efficacy of any intervention due to lack of homogenous population [3,4]. In 2011, the ESHRE (European Society of Human Reproduction and Embryology) consensus group came up with 'Bologna criteria' to define poor responder which also has received some criticism [10]. An effort to refine and develop new criteria for poor responder is still continuing [11].

In older women (>35 years) undergoing IVF, the proportion of poor responders is higher compared to younger women [12]. Consequently, in clinical practice, many of the poor responders are women with advanced age and therefore at high risk of adverse perinatal outcomes [13]. In addition, poor response to ovarian stimulation suggests ovarian ageing and vascular endothelial dysfunction [14]. This vascular ageing and endothelial dysfunction may play a role in adverse perinatal outcomes [15]. Although numerous studies have reported live birth rates following IVF in poor responders, there is very limited data on perinatal outcomes in this group of women. In a study by Sunkara et al., no increased

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risk of preterm birth (PTB) or low birth weight (LBW) was reported in poor responders compared to normo responders [16]. A study by Parlakgumus et al., reported that pregnancy complications like pre-eclampsia and diabetes were not increased in poor responders when compared to their age matched controls who were normo responders [17].

In view of the paucity of data, we decided to conduct a retrospective analysis and compare perinatal outcomes in women who were poor responders with those who were normo responders.

2. Materials and methods

The current study was a retrospective cohort study, which was conducted in a university level infertility unit. Women who underwent fresh ART (intracytoplasmic sperm injection (ICSI) alone or combination of IVF and ICSI) cycle and were either poor responders (≤3 oocytes) or normo responders (4–15 oocytes) were included in the analysis. Each included woman underwent only one fresh cycle during the study period. Women who underwent frozen thawed cycles, mild stimulation protocol, or in whom >15 oocytes were retrieved, were excluded. The study period was between January 2010 to December 2015.

The anonymized data collection was done from unit database and the following parameters were recorded for all the included patients: age, body mass index (BMI), type of infertility, cycle number, indication, protocol used, gonadotropin dosage, number of embryos transferred and the day of embryo transfer, hormonal parameters like follicle stimulating hormone (FSH) and anti mullerian hormone (AMH) along with co-morbid conditions like diabetes, hypertension and thyroid disorders were recorded. Clinical pregnancy and live birth rates per initiated cycle were also recorded.

Data regarding perinatal outcomes of preterm birth (PTB), early preterm birth (early PTB), low birth weight (LBW) and very low birth weight (very LBW) were obtained.

3. Statistical analysis

Categorical variables were summarized using counts and percentages. Quantitative variables were summarized using Mean (SD) for normally distributed variables Median (IQR) for skewed variables. Chi square test was used to compare the proportions between the categorical variables. Independent *t*-test was used to compare the means between two groups for normally distributed variables and Mann-Whitney *U* test was used for skewed variables. Multiple births were excluded from the analysis for perinatal outcomes of PTB, early PTB, LBW and very LBW. Adjusted logistic regression was performed for each perinatal outcome adjusting for confounding factors: female age category, indication, singleton

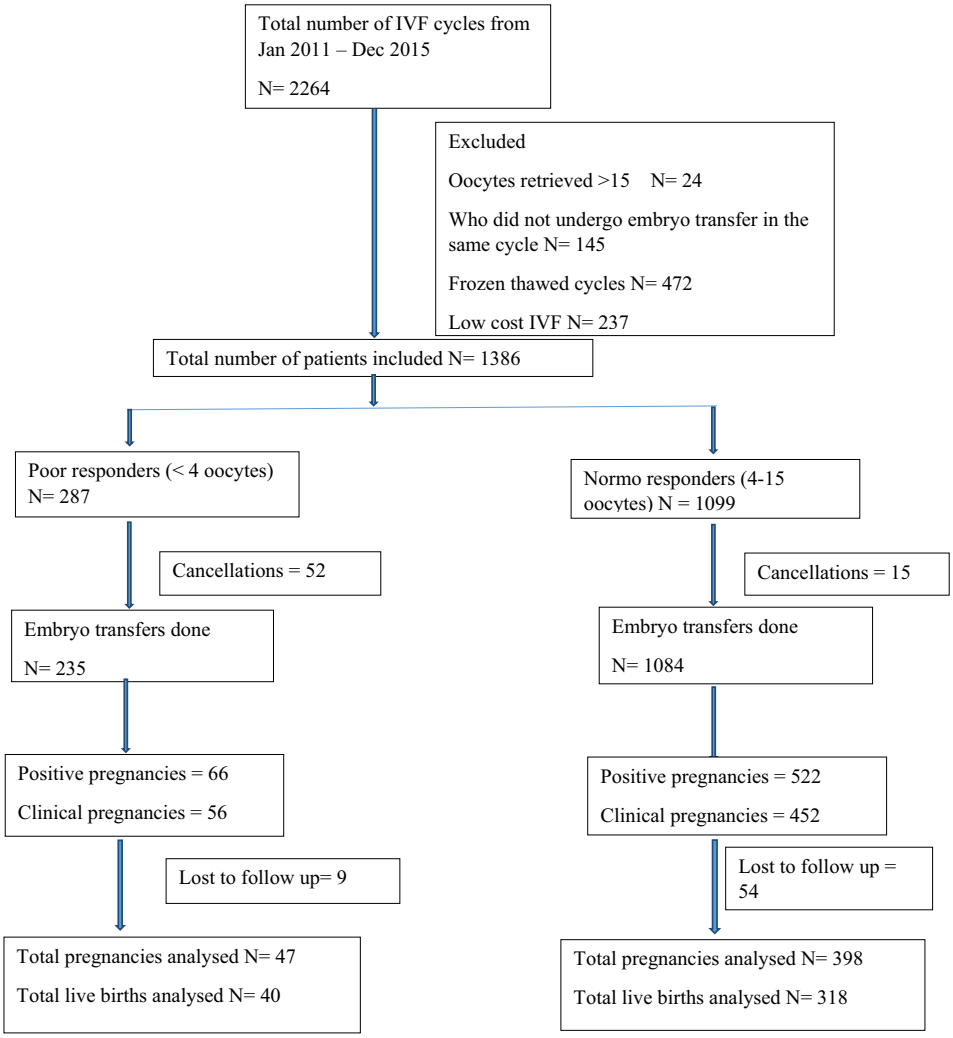

Fig. 1. Data selection process for analysis of live birth and perinatal outcomes in poor responder and normo responder women.

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