THE EMBRYO MULTINUCL
EATION AT THE 2-CELL STAGE IS AN INDEPENDENT FACTOR TO PREDICT ICSI
OUTCOME

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Introduction:
Recently time-lapse systems have been developed to add kinetic criteria for embryo selection improvement. Time lapse brings supplemental data like blastomere multinucleation (BMN) at 2-cell stage. The negative impact of BMN at day-2 on implantation is now well known, however the clinical significance of BMN at 2-cell stage remains scared. The aim of our study was to determine its impact on outcome up to the birth.

Materials and methods:
445 ICSI cycles from November 2012 to December 2014 at the IVF Center of Dijon (France) followed by time-lapse system imaging, were retrospectively included. The analyses were done from fresh and post-thawed transfers of one or two embryos performed at day 2 or 3, for only transfers which we could follow their outcome. The impact of BMN on clinical pregnancy (CPR), implantation (IR), miscarriage (MR) and delivery (DR) rates was evaluated using univariate and multivariate analyses. Three groups of embryo transfers were considered according to 2-cell stage observation, group-1: transfers with embryos without multinucleation (n=242), group-2: all transferred embryos were multinucleated (n=121), group-3: at least one transferred embryo was multinucleated at 2-cell stage (n=203).

Results:
Group-1 CPR (42.5%) was higher than group-2 (18.2%; \(p=0.001\)) and group-3 (36.4%; \(p=0.189\)). Group-1 IR (33.8%) was higher than group-2 (28.7%; \(p=0.26\)) and group-3 (26.2%; \(p=0.031\)). MR was significantly higher in group-2 (39.1%) than group-1 (16.0%) and remained significantly lower considering only fresh embryo transfers. In multivariate analysis, DR significantly decreased when all transferred embryos were multinucleated (OR=0.12; IC95 [0.02;0.64]; \(p=0.013\)).

Discussion:
For the first time we demonstrate that the presence of multinucleated blastomeres at 2-cell stage has a negative impact on birth potential. Thus, embryo multinucleation at the 2-cell stage should be added to the morphological criteria traditionally used and embryos without multinucleated blastomere should be given priority for transfer when available.