

A comparison of blastocyst hatching rate between quarter, semi-, thin and total laser assisted hatching in mouse

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INTRODUCTION: Embryos implantation rate may be decreased when poor hatching rate was caused by the thick or hardening zona pellucida (ZP). Assisted hatching was used to increase hatching rate by ZP broken-down. Laser assisted hatching (LAH) was also used to break ZP and LAH could select the laser wavelength and the open site of ZP to increase effective ZP breakdown. Our purpose was to assessment the effects of hatching rate in mouse blastocyst with different degree of ZP breakdown by LAH methods.

METHODS: All of mouse zygotes were collected and cultured in HTF medium until day 6. Four different LAH (including quarter-, semi-, thin- and total-LAH) was used to make different degree of ZP breakdown in embryos on day 3 and hatching rates were counted on day 6.

RESULTS: Significantly lower hatching rate of blastocyst was found in control on day 6 than other groups with LAH. Hatching rate of blastocyst treated with laser quarter-LAH was higher significantly than control, semi-LAH and thin-LAH (85.3%, 57.1%, 72.9% and 71.1%, respectively; $P < 0.05$), but no significant difference with total-LAH (79.4%, NS). No significant difference of hatching rate was found in semi-LAH and thin-LAH groups.

Groups	Control	Total-LAH	Semi-LAH	Thin-LAH	Quarter-LAH
Number of hatching blastocyst	257	393	281	283	289
Total number of blastocyst	450	539	354	398	339
Hatching rate	57.1%	79.4%	72.9%	71.1%	85.3%*

Table 1.

CONCLUSIONS: LAH was an effective method to increase hatching rate on day 6, especially, quarter-LAH has a higher hatching rate than other groups, significantly. These results indicated that hatching rates were influenced by different degree of ZP breakdown to open ZP and higher hatching rates were found in the embryos with large range of ZP breaking.