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Effects of human amniotic fluid on fracture healing in rat tibia.

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Source

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Abstract

BACKGROUND:

Human amniotic fluid (HAF), including hyaluronic acid (HA) and several growth factors, has been used experimentally in tendon, nerve, and cartilage regeneration and in bone defects because of its positive stimulating effects on regeneration potential. This study was performed to investigate whether HAF was effective on fracture healing.

MATERIALS AND METHODS:

We created 36 tibial fractures in 20-week-old Wistar rats that were divided into three groups. In group 1, fracture lines were instilled with HAF collected at 18th week of the gestation and, in group 2, fracture lines were instilled with HAF obtained at the end of the gestation. HAF which was collected from different period of gestation was used, because the concentration of HA and growth factors in HAF varies considerably during gestation. Group 3 was used as an operative control group.

RESULTS:

Fracture-healing score was highest in group 1 radiologically at the 3rd and 5th week ($P = 0.037$, $P = 0.018$, respectively). In the scintigraphic evaluation, metabolic activity at the fracture site was observed in group 1 more than the others at the 3rd week ($P = 0.010$). Histologically, the highest scores were obtained from group 1 as compared to other groups at the 3rd and 5th week. In the 5th week, predominant cartilage with some woven bone was observed in group 3, while predominantly woven bone with some cartilage was observed in group 1 ($P = 0.036$).

CONCLUSIONS:

Our data suggest that HAF had a positive effect on fracture healing in rat tibia, and also this positive effect was observed more in group 1.

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