

The effects of oral glucosamine sulphate and chondroitin sulphate on focal (traumatic) cartilage damage

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INTRODUCTION: It is a well established fact that focal cartilage damage is difficult to treat owing to its poor reparative ability. Treatment options are generally limited to surgical modalities and although oral supplements using glucosamine sulphate and chondroitin sulphate have been advocated for osteoarthritis, these medications have not been used for the treatment of focal cartilage damage. To establish the effects of these supplements on focal cartilage damage, an experimental trial was performed using rabbits.

METHODS: 18 New Zealand white rabbits weighting approximately 2.5kg and 6 months old were used in this experiment. Animal experiments were conducted in accordance to the conditions approved by the ethical committee on animal experimentations in University of Malaya and in accordance to Malaysian laws and regulation on animal experimentations. Rabbits were anaesthetized accordingly. A focal full thickness articular cartilage defect measuring 5mm in diameter and 3 mm in depth were created on the medial condyle. After 2 weeks following the surgery, oral glucosamine sulphate (GS) and/or chondroitin sulphate (CS) were gavaged on a daily or weekly basis as according to the drug manufacturers' instructions. The dosages of medication provided were appropriate to their body weight as described in previous literatures. The rabbits were divided into 3 groups with each group consisting of 6 rabbits: The control Group I (n=6), Group II treated with only GS (n=6) and Group III treated with GS and CS. Three rabbits in each group were euthanized at the end of 3 and 6 months and the operated site were sent for histological, immunohistology and quantification analyses.

RESULTS: Although a general histological view of the sites revealed slightly improved repair quality in Group III as compared to the other groups, based on the Brittberg histological scoring system, there were no differences between these groups. However, we found that there were notable differences between the concentration of S-GAG expressed between groups II and III as compared to group I.

Differences were only noted at the end of 6 months and not at the end of 3 months.

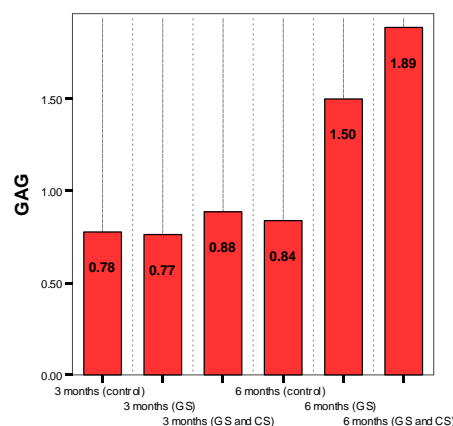


Fig. 2: Comparison of the amount of S-GAG in the defect sites of the different groups (GS=Glucosamine Sulphate; CS=Chondroitin Sulphate)

DISCUSSION & CONCLUSIONS: From this preliminary study we can suggest that GS and CS may play a role in the treatment of traumatic focal cartilage damage however from our statistical analyses; these results were not significant owing to the small sample size. Future studies involving a larger number of subjects may be required before the use of GS and CS can be justified for patients with traumatic cartilage damage.

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