no differences were observed between the two groups concerning postoperative complications and mortality rates.

**Conclusion**: While early surgical intervention within the first 48 h is commonly advocated, delayed surgery remains a significant approach for many patients. No differences in postoperative complications and mortality rates between the early and delayed intervention groups were found. These findings highlight the need for further exploration into the factors influencing clinical outcomes beyond the temporal aspect of surgical timing.

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## GLUCOSAMINE AND/OR CHONDROITIN VERSUS STRUCTURAL MODULATION OF GUT MICROBIOTA: FRIEND OR FOE?

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**Objective**: Despite multiple clinical trials of the use of glucosamine (GS) and chondroitin sulfate (CS) in osteoarthritis (OA), controversy regarding the efficacy of these drugs. Among the most debatable issues is combining GS with CS because of probable interference with GS absorption. According to the collected data, inflammation in OA is characterized as an innate immune response. Gut microbiota (GM) is a collection of microbial populations, responsible for immunological functions. Targeting the (GM) may represent a new therapeutic strategy for chronic pain management of OA. The aim of the study was to assess the efficacy and safety of combination therapy of Bacillus genus composition (BGC) with CS compared to GS and/or CS treatment in patients with OA.

**Methods**: Our study was performed in 30 patients with Kellgren– Lawrence radiographic grade I–II knee OA and moderate-to-severe pain (mean  $\pm$  SD global pain score 64.2  $\pm$  12.1 mm on a 100-mm visual analog scale [VAS]). Patients were randomized to receive either CS in a monotherapy (Fish, group 1, n = 10) or combined therapy with BGC plus CS (Fish, group 2, n = 10) or treatment with CS (Bovine, 1500 mg) plus GS (1200 mg) (group 3, n = 10) for 28 d. The main outcomes included the mean change in the investigator's global assessment of disease activity, total WOMAC, pain, stiffness and function subscale scores on the WOMAC.

**Results**: Patients of the group 3 (BGC + CS), according to the WOMAC score, have shown a statistically significant reduction in pain intensity, stiffness improvement in physical function.



After 14 d, the intensity of pain was lower by 47.83% (p < 0.05), and on the 28th day of treatment by 63.59% (p < 0.05) smaller relative to the baseline. As well as joint stiffness. On the day 14 the reduction was 50.43% (p < 0.05), by the day 28—63.59% (p < 0.05). Improving of physical function on the day 14 was achieved—51.18% (p < 0.05) and 51.34% at the end of treatment (p < 0.05).



**Conclusion**: The results of our trial demonstrates a superiority of combination therapy of CS plus BGC over the traditional approaches including GS and/or CS treatment in terms of reducing joint pain, stiffness and functional impairment in patients with symptomatic knee OA for 28 d.