

Executive Summary

Objective

The objectives of this study were (1) to describe use of glucosamine or chondroitin products among general population equal to or older than 40 years old and outpatients with skeletal and muscular disease in Korea, and (2) to assess clinical effectiveness and safety of glucosamine and chondroitin therapy in treating patients with osteoarthritis.

Methods

A descriptive and exploratory study was conducted using questionnaire surveys. Among nationwide population equal to or older than 40 years, we randomly select subjects using a proportional allocation method base on age, gender, and residence. We started the survey on September 19, 2009 and continued the questionnaire until we earned 1,000 respondents taking glucosamine or chondroitin or September 30, 2009. Data were collected using a telephone survey with the questionnaire developed for the purpose of the study. Additionally, we interviewed patients who visited rheumatologic clinics for skeletal muscular diseases at two university-hospitals in Seoul, from November 2, 2009 to November 13, 2009.

We performed a systematic review using existing systematic reviews (SR) to investigate clinical effectiveness and safety of glucosamine (sulfate or hydrochloride) and chondroitin therapy. Electronic databases were searched from 1950 to October 2009, including MEDLINE, EMBASE, Cochrane Library, CRD database, Koreamed, Kmbase, etc. We assessed the relevance and quality of eleven systematic reviews related to the research questions. We also searched additional randomized controlled trials (RCTs) regarding glucosamine after 2007 and chondroitin after 2005.

Three reviewers independently screened all the references, assessing the quality of included articles using the 'assessment of multiple systematic reviews' (AMSTRA) tool for SRs and the Cochrane Risk of Bias tool for RCTs. Data were extracted independently by one reviewer using a standardized data extraction table and checked by others.

Results

Among a total of 26,673 people equal to or older than 40 years, the rate of response was 29.60 percent. The current user of glucosamine were 12.18 percent, and those who have ever used glucosamine were 29.93 percent. The current users of chondroitin were 0.13 percent, and those who have ever used chondroitin were 1.43 percent. Total purchase of glucosamine products in Korea was estimated at approximately 280 billion Korean won (KRW): 6,000 KRW per person. In addition, current users of glucosamine responded that the purpose of glucosamine use was not to treat osteoarthritis but to promote health or prevent osteoarthritis.

In person to person interview on outpatients with skeletal muscular diseases, the percentage of current users of glucosamine was 15.78 percent, and that of patients who have ever taken glucosamine was 29.93 percent. In disease-specific glucosamine use, patients with rheumatoid arthritis and osteoarthritis that do not cause direct damage to joints showed a relatively high intake rate compared to other diseases. For the appropriate use of glucosamine, clinicians need to educate outpatients visiting rheumatologic clinics.

We selected two existing systematic reviews of glucosamine and one systematic review of chondroitin as the best available evidence. We included all RCTs that are fulfilling our inclusion criteria (that is, where the treatment duration was at least 1 month), and found 10 additional RCTs from new search after the latest search that was done by existing SRs. Finally, we evaluated 37 articles; 24 articles of glucosamine, twelve articles of chondroitin, and one articles of glucosamine and chondroitin combination.

Analysis was restricted to studies with adequate allocation concealment, where glucosamine was not significantly beneficial in pain reduction (SMD -0.05, 95% CI (-0.14, 0.04), $I^2 = 0\%$) and function improvement (SMD -0.08, 95 % CI (-0.17, 0.00), $I^2 = 0\%$). Also, in meta-analysis stratified by research funding source, glucosamine failed to show positive results in both pain reduction (SMD 0.00, 95 % CI (-0.11, 0.11), $I^2 = 0\%$) and function improvement (SMD 0.05, 95 % CI (-0.17, 0.06), $I^2 = 0\%$). These findings were similar to the results for chondroitin.

Conclusion: In investigating the use of glucosamine, current user of glucosamine were 12.18 percent, and people who have ever used glucosamine were 29.93 percent. The nationwide expenditure on glucosamine products was estimated approximately at 280 billion KRW: 6,000 KRW per person. The quality of the evidence from the GRADE approach in glucosamine sulfate, glucosamine hydrochloride, chondroitin, and glucosamine and chondroitin combination was low or very low. It needs to provide an appropriate information about glucosamine or chondroitin to the consumer due to accessibility of the glucosamine or chondroitin as both health functional food and medical drug in Korea.