Objective: Objective of this review is to summarize the currently available information on possible chondroprotective effects of mineral waters or mineral components on chondrocyte or cartilage cultures.

Methodology: We conducted a search of the literature by PubMed and Scopus (the period examined was 1980–2013) using the terms “chondrocyte” and/or “cartilage” in combination with “mineral water”, “hydrogen sulphide”, “sulphur hydrogen”.

Results: A chondroprotective role of mineral water or mineral components was demonstrated by some pilot studies in chondrocyte cultures. Burguera studied the activity of hydrogen sulphide (H\(_2\)S) in human osteoarthritic (OA) chondrocytes stimulated with Interleukin (IL)-1\(\beta\). They analyzed the effects of different concentrations of a fast (NaHS) or a slow (GYY4137) release H\(_2\)S donor demonstrating a significant reduction of Nitric Oxide (NO), Prostaglandin (PG)-E\(_2\), and Reactive Oxygen Species (ROS) levels in culture medium and of inducible Nitric Oxide Synthase (iNOS) gene expression, induced by IL-1\(\beta\). These data were confirmed by Li in normal human chondrocytes stimulated by Lipopolysaccharide (LPS). GYY4137 decreased LPS-induced production of NO, PGE\(_2\), Tumor Necrosis Factor (TNF)-\(\alpha\) and IL-6, reduced the levels and catalytic activity of iNOS and of Cyclooxygenase-2 (COX-2) and reduced LPS-induced NF-\(\kappa\)B activation. Furthermore GYY4137 showed a strong inhibition on oxidative stress-induced cell death. The incubation of chondrocytes cell line C-28/I2 with another H\(_2\)S donor, Natrium Hydrogen Sulphide (NaHS), proved that constitutive as well as IL-1\(\beta\)-induced IL-6 and IL-8 expression was partially and transiently blocked by the NaHS. Fioravanti studied the chondroprotective role of highly mineralized water, strongly acidic sulfate, rich in calcium, magnesium and iron [Vetriolo’s thermal water (VW)] in human OA chondrocytes cultivated with or without IL-1\(\beta\). For this purpose chondrocytes were cultivated in Deionized Water (DW) (DW-DMEM, controls), or in one of three different VW-DMEM media, in which DW had been totally (100%) or in part (50% or 25%) substituted with VW. The results showed that VW alone at 25% or 50% concentration did not affect the viability of cultured chondrocytes, and determined a significant survival recovery rate in cultures stimulated with IL-1\(\beta\). NO levels were low both in DW-DMEM cultures and in those reconstituted with 25% or 50% of VW, and were significantly increased by IL-1\(\beta\). VW at 25% or 50% concentration significantly reduced the NO production induced by IL-1\(\beta\). The data of NO levels were confirmed by the immunocytochemistry assay for iNOS. Furthermore, the authors demonstrated a protective effect of VW at 25% or 50% concentration on IL-1\(\beta\)-induced apoptosis.

Conclusions: Presented data are stimulating, but we don’t ignore the existence of a complex relationship between mineral water and cartilage health.
series of problems and limitations. One of the critical points is the controversial problem of the absorption of the minerals dissolved in mineral waters, furthermore, extrapolation of in vitro results to in vivo should be undertaken with caution.

Further studies are needed in vitro to confirm these preliminary findings.

**Keywords:** Chondrocyte, Cartilage, Culture, Mineral water, Hydrogen sulphide

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