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A new treatment for pain physicians to add to their repertoire of treatments: Glucopuncture

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To the Editor,

Glucopuncture is a therapy involving injections for managing various musculoskeletal conditions and mild regional pain. It involves administering multiple local injections containing low concentrations of glucose or dextrose.[1] The objective is to facilitate tissue repair and alleviate referred pain. Glucopuncture consists of weekly sessions of multiple local injections of isotonic sugar water (ISW), such as G5W (Glucose 5% in Water) or D5W (Dextrose 5% in Water). These solutions appear to positively affect the physiological repair mechanisms of damaged or inflamed tissues, including muscles, tendons, ligaments, cartilage, and peripheral nerves. Patients experience faster recovery and reduced pain, particularly with repeated G5W sessions.[1] There are two main approaches. There are two main approaches: superficial injections for pain modulation and deeper injections for tissue repair.

Glucose is the primary energy source for cellular health. One glucose molecule gives rise to more than 30 ATP molecules during aerobic respiration. The conversion of ATP into ADP releases about 30 kJ/mol of energy to the cells. In other words, glucose can be considered a direct energy provider to cell metabolism as each molecule can deliver about 900 kJ/mol. ATP may play a significant role in this process. The mechanism of action is likely to be complex and multifactorial. In vitro studies have indicated that glucose stimulates the production of various growth factors, such as PDGF, TGF-β, EGF, b-FGF, IGF-1, and CTGF, which may be crucial for tissue repair.[2–4]

Prolotherapy advocates the use of sclerosing products such as phenol, hypertonic dextrose, or sodium morrhuate, which are injected into the entheses of ligaments, bands, and tendons. In recent decades, hypertonic dextrose (usually 12.5–25%) has become the standard among most physicians practicing prolotherapy because it is much safer than phenol or sodium morrhuate.[4] Hypertonic injections aim to induce a local inflammatory reaction and stimulate scar tissue formation in ligaments. It is postulated that hypertonic dextrose injections promote tissue repair through growth factors and modulate pain by acting on the TRPV1 receptor. In traditional prolotherapy, injections are primarily administered into joint cavities, entheses, and ligaments.[5] Glucopuncture differs from prolotherapy (PT) in that PT typically employs hypertonic sugar water injections (glucose or dextrose at 10–20%) that cause osmotic cell death, followed by an inflammatory response, subsequent proliferation (hence the term prolotherapy), and tissue repair. Hypertonic sugar solutions are always combined with a local anesthetic (LA). In glucopuncture, shallow injections are typically administered into soft tissues such as the dermis, fascia, muscles, tendons,

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entheses, and ligaments. Whereas PT primarily involves injections into ligaments, tendons, entheses, and joint cavities.[5]

Several clinicians have found that 5% glucose injections are an affordable and easily learnable treatment for pain modulation and support of periarticular tissue repair.[1,2] However, large-scale randomized controlled trials are necessary to provide specific recommendations regarding ideal protocols and indications for glucopuncture. In this context, we believe that in the near future, publications on glucopuncture will increase and its clinical use will become more widespread.

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