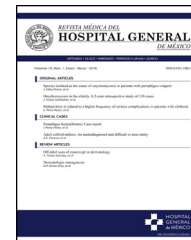




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ORIGINAL ARTICLE

Effectiveness of topical phenytoin therapy versus platelet-rich plasma for tympanic perforations closure: Comparative study

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KEYWORDS

Perforated eardrum;
Platelet rich plasma;
Phenytoin

Abstract

Background: The tympanic membrane perforation is generally caused by infection or trauma. It is a condition that can cause hearing loss; its incidence varies between 1 and 3% of the population in the United States, and even less than 1% in the world population.

Objective: This study is to conduct a pilot test in which the effectiveness of conservative treatment was measured and compared by applying phenytoin or platelet-rich plasma to close tympanic perforations and the healing period of the same.

Patients and methods: Ten patients were included and all of them fulfilled the selection criteria: Age over five years-old, indiscriminate sex with a diagnosis of perforated eardrum, eardrum perforation between 30 and 60% and presence of tympanic remnant; and no previous surgical treatment. Elimination criteria were those patients with marginal eardrum perforations, patients who were not on antiplatelet drugs or anticoagulants, poor response to platelet-rich plasma after 6 weeks, patients with known autoimmune, active neoplastic, atopic otic conditions and those currently under immunosuppressive treatments. Participants were randomized into two groups according to treatment: phenytoin (0.2 mg) or platelet-rich plasma (0.2–0.5 cc). **Results:** Ten patients with unilateral tympanic perforation were recorded whose average age was 26.9 ± 14.9 years; the sex distribution was 1.5:1 male predominance. In treatment A, the average closing time was 3.8 ± 0.836 weeks; meanwhile, in the treatment B the closure time was 5.2 ± 0.836 weeks.

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PALABRAS CLAVE

Perforación
timpánica;
Plasma Rico en
Plaquetas;
Fenitoína

Eficacia de la terapia tópica de fenitoína versus el plasma rico en plaquetas para el cierre de perforaciones timpánicas. Estudio Comparativo

Resumen

Antecedentes: La perforación de la membrana timpánica generalmente es producida por alguna infección o traumatismo; es un padecimiento que puede causar hipoacusia, y su incidencia oscila entre el 1 y 3% de la población en los Estados Unidos, siendo aún menor al 1% en la población mundial.

Objetivo: Se realizó una prueba piloto en la cual se midió y comparó la eficacia del tratamiento mediante la aplicación de difenilhidantoína o plasma rico en plaquetas para el cierre de perforaciones timpánicas y el tiempo de reparación de la misma.

Pacientes y Métodos: Se incluyeron diez pacientes quienes cumplieron los criterios de selección: Edad mayor a 5 años, sexo indistinto, diagnóstico de perforación timpánica entre 30-60%; presencia de remanente timpánico sin tratamiento quirúrgico previo. Criterios de eliminación: perforaciones marginales de tímpano, pacientes con terapia anticoagulante o anti-agregante e inmunosupresora; pobre respuesta al tratamiento tras 6 semanas. Asimismo, pacientes con historial de procesos autoinmunes, neoplásicos o atópicos.

Resultados: Se obtuvieron diez pacientes con perforación unilateral, con edad promedio de 26.9 ± 14.9 años y proporción de 1.5:1, con predominio masculino. En el tratamiento A, el tiempo promedio de cierre fue 3.8 ± 0.836 semanas; mientras que, en el tratamiento B, el tiempo de cierre fue 5.2 ± 0.836 semanas.

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Background

Generally, the tympanic membrane perforations (TMP) are produced by severe infections or traumatisms. It is a condition that can cause hearing loss, and its incidence varies between 1 and 3% of the population in the United States, and even less than 1% in the world population. However in Mexico there is no clear data for this condition.^{1,2}

Most (78.7%) of the TMP heal spontaneously over a period of 7–10 days with few functional consequences, but the risk of failure of spontaneous curing results in very factual persistent perforation.^{1–4}

One factor influencing to chronicity (over three months) of the TMP is the persistent infection; other factors related to this phenomenon include the nutritional and immune status of the individual, shape and dimensions of the perforation; and therefore prior application of the topical agents, mostly corticosteroids.^{1,3,5}

Regeneration of the tympanic membrane, after perforation, is a complex biological process involving epithelial proliferation and migration, with fibroblast proliferation and angiogenesis which finally ends with the remodeling of the tissue.^{6,7}

After three to six weeks of presentation, surgical management must be considered; in the experimental field, a perforation is considered chronic when its development time ranges from eight to fifteen weeks.^{5,6}

In Mexico there is no protocol for conservative treatment of tympanic perforations, the therapeutic method of choice is surgery, where tympanoplasty with autogenous connective tissue is the treatment of choice in most cases, due to the demonstration of high success rates (88–95%).^{7,8}

Before 1950, the usage of surgical treatment for tympanic membrane perforation was focused to eliminate the cause, but any reconstructive action or procedure was not planned. In 1952, Wullstein made the first description of a new functional procedure using grafting materials such as fascia, perichondrium, periosteum, vein, dura mater and cartilage. However, was Zöllner who popularized and established the principles for this technique in 1955; but due to the disadvantages of tympanoplasty (general anesthesia, longer postoperative rest time, limitation of the normal activities for the patient, making incisions to expand the surgical exposure) a less abrasive approach is sought.^{1,3,9}

Nowadays, thanks to advances in microsurgical technology and the implantation of prosthetic ossicular counterparts, the procedure has suffered important changes; many authors agree that a satisfactory approach for tympanic perforations treatment would be the administration of a topical and bio-absorbable agents, which favor the closure, by the disruption of the epithelial edge of the perforation with no side-effects and an ambulatory way of placement, without requiring further intervention.⁸

According to Garzón-Arruel et al.¹⁰ there are a wide variety of techniques to prevent removal of the squamous epithelium and trigger a reparative fibroblastic reaction in the middle fibrous layer of the tympanic membrane, including chemical (phenytoin, vitamin c, trichloroacetic acid, etc.), mechanical and suspension of “physiological” characteristics (superficial temporal fascia, amniotic membrane, bovine collagen, etc.)

The procedures associated with bio-absorbable agents (paper patches, absorbable gelatin film, hyaluronic acid, etc.) favor its closure without the complications related

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