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Mesenchymal stromal cells induce dentin-pulp tissue regeneration in decellularized tooth: in vitro and in vivo evidence

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Abstract

Objective: To evaluate the capacity of mesenchymal stromal cells (MSCs) to induce dentin-pulp tissue (DPT) in decellularized tooth (DT). Methods: An experimental model was generated for evaluating the capacity of MSCs to induce DPT regeneration in DT. Human bone marrow MSCs, embedded into platelet-rich plasma (PRP) were placed into the root canal (RC) of human DT (DT/MSCs). The DT/MSCs were cultured with alpha-MEM-Chang medium supplemented with 20 % FCS. After 7 and 15 days of culture, the DT/MSCs were harvested, fixed and processed for histological Analysis. In order to carried out. The in vivo evaluation, the DT/MSCs were subcutaneously implanted in C57BL/6 mice. In some experiments, a complex of MSC and collagen microspheres (CM) were included in PRP clot and placed into the RC of DT (DT/MSCs/CM). Radiographs were performed in mice implanted with the DT/MSCs. After 4 months, animals were sacrificed and each DT/MSCs was removed and processed for histological evaluation. **Results:** Histological analysis of teeth cultured in vitro showed the presence of cell foci lining the RC and neoformed DPT. Radiographic studies showed areas of increased radiopacity and reduced RC lumen in both DT/MSCs and DT/MSCs/CM, after 4 months of postimplantation. The DT/MSCs and DT/MSCs/CM implants were completely integrated and vascularized in the host tissue. The histology showed the presence of DPT, reduction of the RC lumen and odontoblast-like cells. The DT/MSCs/CM revealed the presence of a pulp stone-like structure formed by mineralized tissue and collagen. Conclusions: These results show that MSCs induce DPT regeneration in DT. Transplantation of MSCs in RC may have therapeutic potential for pulp regeneration in tooth injuries affecting the vitality of dental pulp.

Keywords: dentin, dental pulp, mesenchymal stromal cells, regeneration, regenerative endodontics

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Abstract

Oral health is, in essence, the work of the general dentist and he cannot ignore the responsibility of providing care to every patient. The excessively high incidence of HIV + patients among the population makes it difficult for a small number of dentists to face them, therefore, it is necessary to be informed in order to obtain a lower risk of clinical infection and the prevention of HIV+ infection, through the preventive inclusion of antiretroviral drugs. A standard protocol for dental surgical care is not enough. There is an obvious group of needs in each type of patient that certainly need to be covered. In the case of patients with VHI+, such vulnerable patients, it is necessary that the dental guild has the attitude and skills to ensure the necessary care. Experimental Methods: FOUNDATION EUDES, allowed to make a surgical case as collection methods, to demonstrate the changes that are proposed to vary from the surgical protocol. This clinical case was able to establish the suitability and adaptation of the use of antiretrovirals for the protocol in HIV + patients. **Results**: The effective result of this proposed protocol will be determined by the correct use of antiretroviral treatment. According to the classification according to WHO, said patient being Stage I, his therapy was maintained (Tenofovir + emtricitabine 300 / 200mg 1 tablet a day. Atazanavir 300mg, 1 tablet a day. Ritonavir 100mg, 1 tablet a day. No suspensions). Conclusion: Said surgical protocol will provide the dental guild with the necessary guidelines to provide a safe dental practice to patients and staff, avoiding the dissemination, concealment and preservation of infectious diseases within the dental office, in order to reduce the risks of contamination of infectious agents and comply with moral and legal requirements of professional practice; with national and international laws and regulations.

Keywords: Discrimination, Virus, Antirretrovirales, Hiv, Venezuela.

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Resumen

La simbiosis existente entre diversas patologías de la cavidad bucal y la diabetes ha sido motivo de importantes y diversas investigaciones. En general, podemos encontrar un amplio espectro de lesiones en la cavidad bucal que pueden darse con mayor frecuencia en los pacientes diabéticos. Objetivo: determinar la prevalencia del síndrome de Grinspan y su posible relación con el liquen plano oral (LPO) en una muestra de pacientes con diabetes tipo 2, y la hipertensión arterial de la consulta externa de control de Diabetes del Hospital Dr. Adolfo Prince Lara, ubicado en la ciudad de Puerto Cabello, estado Carabobo. En el año 1965, se definió el síndrome de Grinspan, que se caracteriza por la presencia de hipertensión arterial (HTA), diabetes mellitus y LPO de manera simultánea. También pueden encontrarse en la mucosa oral lesiones que guardan una gran similitud con el LPO, pero que tienen su etología en materiales de obturación o determinados fármacos, como algunos hipoglucemiantes orales (clorpropamida, metformina); estas patologías se denominan "lesiones liquenoides". El LPO es considerado una patologia potencialmente malignizable, aunque su malignización se sitúa en el 0,5-1%, según los distintos autores. Material y Método: La investigación se realizó mediante la inspección de la historia clínica, consentimiento informado, exámenes paraclínicos, examen clínico intrabucal directo mediante el uso de la triada Odontológica y bajalenguas, la inspección indirecta a través de fotografías clínicas intrabucales. **Resultados:** La población y muestra fue de 45 pacientes, donde se diagnosticaron clínicamente al 40% de los pacientes que acudieron a la consulta de control de diabetes con el Síndrome de Grinspan, ya que los mismo presentaron la triada de Hipertensión Arterial, Diabetes y liquen plano Oral de tipo erosivo y reticular. Conclusiones: En cuanto a las lesiones de la mucosa oral, varios estudios indican que el LPO, la estomatitis aftosa y/o la candidiasis se presentan con cierta frecuencia en pacientes diabéticos. En nuestro estudio, constatamos una prevalencia del 40% de LPO en pacientes con diabetes e Hipertensión Arterial, ligeramente superior a la obtenida por otros autores. Diagnosticando así el síndrome de Grinspan, debido a las cifras se debe considerar un problema de salud pública debido al que el liquen plano oral es un desorden potencialmente maligno y nos obliga aumentar el control epidemiológico en estos pacientes.

Palabras clave: hipertensión, Diabetes, Grinspan, Síndrome, liquen.

Prevalence of Grinspan syndrome in a Venezuelan population Abstract

The symbiosis between various pathologies of the oral cavity and diabetes has been the subject of important and diverse investigations. In general, we can find a wide spectrum of lesions in the oral cavity that can occur more frequently in diabetic patients. **Objective:** to determine the prevalence of Grinspan síndrome and its association with oral lichen planus (OLP) in a sample of patients with type 2 diabetes, and arterial hypertension from the Diabetes control outpatient clinic at the Dr. Adolfo Prince Lara Hospital, located in the city of Puerto Cabello, Carabobo state. In 1965, Grinspan syndrome was defined, which is characterized by the presence of arterial hypertension (HTN), diabetes mellitus and OLP simultaneously. Lesions that are very similar to OLP can also be found in the oral mucosa, but which have their etology in filling materials or certain drugs, such as some oral hypoglycemic agents (chlorpropamide, metformin); These pathologies are called "lichenoid lesions." According to different authors, OLP is considered a potentially malignant pathology, although its malignancy is 0.5-1%. Material and Method: The research was carried out by means of the inspection of the clinical history, informed consent, paraclinical examinations, direct intraoral clinical examination through the use of the dental triad and lower tongues, the indirect inspection through intraoral clinical photographs. Results: The population and sample consisted of 45 patients, where 40% of the patients who attended the diabetes control consultation were clinically diagnosed with Grispan Syndrome, since they presented the triad of Arterial Hypertension, Diabetes and lichen Oral plane of the erosive and reticular type. **Conclusions**: Regarding the lesions of the oral mucosa, several studies indicate that OLP, aphthous stomatitis and / or candidiasis occur with some frequency in diabetic patients. In our study, we found a 40% prevalence of OLP in patients with diabetes and Arterial Hypertension, slightly higher than that obtained by other authors. Thus diagnosing Grinspan syndrome, due to the figures, it should be considered a public health problem because oral lichen planus is a potentially malignant disorder and it forces us to increase epidemiological control in these patients.

Keywords: hypertension, Diabetes, Ginspan, Syndrome, lichen.

Prevalence of the dentoalveolar traumas and their approach in children with ages between 8 and 15 years in Ymca Valencia Sports Complex, Carabobo State

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Abstract

following work was a descriptive, non-experimental cross-sectional The observational investigation whose general objective was to determine the prevalence of cases of dentoalveolar trauma in children aged between 8 to 15 years in the various branches of sport implemented in the YMCA Valencia sports complex Carabobo state. Dentoalveolar traumas (ADD) are a high frequency incident in children where both teeth, bone and other supporting tissue are affected, as a result of some physical impact. The population involved consisted of 191 young athletes with ages between 8 and 15 years and 10 coaches who are members of the YMCA Valencia sports complex, the type of sample was finite, stratified and consisted of 75 subjects and finite census sample for the 10 coaches. The research was based on eight months of study (November - June) of the 2018 - 2019 period. To collect the data, observation was used as a technique and as an instrument a checklist, which was designed with 28 dichotomous questions for the representatives of the subjects and 30 dichotomous questions for the coaches of the institution, which was approved by a specialist for their Validity and Kuder Richardson's formula provided the reliability of the processed data, giving a result of 0.87 for the instrument applied to representatives and 0.71 to the instrument for coaches. The results were then interpreted through the raising of frequency tables and graphs, giving the conclusion of the investigation; the prevalence of dentoalveolar traumas of children aged 8 to 15 years in the YMCA Valencia sports complex, Carabobo, is 71%, and the need to train and educate coaches regarding the way in which this type of trauma should be addressed was evidenced.

Keywords: Trauma, dentoalveolar, sports, prevalence, injure.