Dental Traumatology

Dental Traumatology 2010; **26**: 530–531; doi: 10.1111/j.1600-9657.2010.00927.x

Arbitrary, contradictory and misleading methods and materials produces false results about the Save-A-Tooth emergency tooth preserving system

LETTER TO THE EDITOR

Dear Sir,

I am writing to point out the inaccuracies and erroneous conclusions proposed in the June, 2010 article, 'Effect of temperature and storage media on human periodontal ligament fibroblast viability' by Beatriz Souza et al., pp. 271–5.

In this study, the authors test several solutions for PDL viability in different conditions. One of these solutions is termed, 'Save-A-Tooth'. The authors claim to have prepared a Hank's Balanced Salt Solution according to the formula listed in an article by Krasner and Person, 1992. In this article, there is no such formulation elaborated. The ingredients of the formula are listed but not how they are mixed. In essence, Dr Souza et al. guessed at the specific method of formulation and then proceeded to call this formulation, 'Save-A-Tooth'. They then name this erroneous formula 'Save-A-Tooth' no <16 times in the remaining part of the article and conclude that 'Save-A-Tooth' maintains vitality more poorly than any of the other media tested.

First, the product, 'Save-A-Tooth' is not merely a container filled with a Hank's Balanced Salt Solution. It is a six-part system devised to anticipate all of the potential pitfalls that may occur during the transfer of an avulsed tooth from the accident site. Virtually, all studies on the treatment of avulsed teeth focus on the preservation fluid and disregard the first and primary warning on every avulsed treatment recommendation, 'do not touch the root of an avulsed tooth'. This recommendation is made because the periodontal ligament cells remaining on the root surface are very delicate and can be crushed by finger pressure. Therefore, regardless of the storage medium used, it must be placed in a transport medium that can protect these delicate PDL cells.

Second, I feel that the name 'Save-A-Tooth' should not have been used in this article because the 'Save-A-Tooth' system was not tested. The authors should have termed the solution, 'an experimental self-concocted Hank's Balanced Salt Solution'. Preparing a correct formulation of Hank's Balanced Salt Solution is very difficult and the formula used in the Save-A-Tooth system is prepared under very strict conditions and tested extensively for correct pH and formulation. The authors do not say how they constructed this formula used in the study and therefore have no right to call it 'Save-A-Tooth'.

Paul Krasner
Clinical Professor, Department of Endodontology
School of Dentistry
Temple University
Philadelphia, PA
USA
e-mail: endsurg@comcast.net

Dr Krasner is affiliated with the company, Phoenix-Lazerus inc, that manufactures Save-A-Tooth.

RESPONSE FROM THE AUTHORS

At first, it is a pleasure to know that you have read our article (1). We know that the Save-A-Tooth system was invented in 1987 by Dr Paul Krasner, and has been on the market since 1988. (http://www.save-a-tooth.com/us/faq.html). We recognize the importance of the Save-A-Tooth, a six-part system, which contains Hank's balanced salt solution (HBSS).

HBSS has been scientifically proven to be an effective media for preserving the viability, mitogenicity and clonogenic capacity of periodontal ligament cells stored for up to 24 h (2, 3).

I think we have a terrible misunderstanding. The media tested in our study (1) were sterile manipulated Hank's balanced salt solution (sHBSS), non-sterile manipulated HBSS (nHBSS), skimmed milk, *Save-A-Tooth*, minimum essential medium (positive control) and water (negative control). Perhaps we have made a mistake when we called the Save-A-Tooth system as a solution. Please,

note that we used the same terminology (Save-A-Tooth) employed in other previous studies (4, 5), in which the authors referred to the solution (HBSS) as being Save-A-Tooth. In fact, we did not test the system, but the solution (HBSS) contained in the Save-A-Tooth system (http://www.Saveatooth.com/us/what.html). The box was purchased in January 2007 (Phoenix-Lazerus, serial 5318, Exp 01/09), stored at room temperature and only opened at the start of the experiment (June 2007).

For the experiment, we prepared the HBSS with the ingredients proposed in the Save-A-Tooth box (serial 5318), in concentrations presented by Krasner and Person (6). By the way, it must be emphasized that this solution was manipulated under supervision of the Department of Pharmaceutical Sciences (UFSC – Federal University of Santa Catarina), also under very strict conditions and tested for correct pH. Please, be sure that we do not play around with mixing liquid and powder. We have never stated that such prepared solution was Save-A-Tooth. To clarify this point, it is important to read carefully the materials and methods section (1). In our article, every time we mention Save-A-Tooth we are referring to the solution taken from a Save-A-Tooth box (serial 5318), and not to the prepared HBSS.

Based on our results, we conclude that Save-A-Tooth (please read as *the solution contained in the Save-A-Tooth system*) maintained cells' viability more poorly than any of the other media tested, and had a detrimental effect on cells after 24 h. There are no inaccuracies and no erroneous conclusions in our article (1). As you could see, both sterile HBSS (sHBSS) and non-sterile HBSS (nHBSS) produced better results than the HBSS present in the box of Save-A-Tooth system.

The results also showed that skimmed milk at 20°C is a good storage medium for up to 48 h (1). On the Save-A-Tooth web site (http://www.save-a-tooth.com/us/why.html), we can find statements that are a bit questionable such as '*Teeth left in milk for over an hour will start to die because milk does not have the nutrients tooth cells need to reproduce new root cells*'. I would like to ask you to support this statement by scientific evidences. It seems that such statement is in contrast with previous studies (7, 8). Confluent monolayers of fibroblasts stored in milk maintained a high percentage of vital cells for 6 h (6). Teeth stored in milk up to 6 h before replantation in monkeys healed with normal healing (7). In our study (1), Save- A-Tooth solution was always significantly less effective than milk. This supports the findings of other studies (4, 5). If the evidence in the literature gives support for milk being better than HBSS, so our study is very important.

It is known that the Save-A-Tooth is a six-part system, but the purpose of our study was to compare the effectiveness of several storage media, including the HBSS contained in the Save-A-Tooth system. We did not test the importance of other parts of the system on cell viability.

In fact, we could have termed the prepared solution as you suggested, or perhaps test 1 and test 2, experimental 1 and experimental 2, and so on. We decided to name sterile HBSS (sHBSS) and non-sterile HBSS (nHBSS). The most important is that we have never named the solutions we have prepared as Save-A-Tooth. We did not prepare the solution present in the Save-A-Tooth system. We have only made use of it.

Everyone has the right to do good research and compare storage media. We are sure that this study (1) was well done, and has been reviewed by highly esteemed experts in the field.

Finally, it is also important to state that we have no commercial interest in any product mentioned in the article.

We really hope that your doubts have been solved.

Best regards.

Mara C.S. Felippe
Dentistry Department
Federal University of Santa Catarina – UFSC
Florianópolis, SC, Brazil

References

1. Souza BDM, Lückemeyer DD, Felippe WT, Simões CMO, Felippe MCS. Effect of temperature and storage media on human periodontal ligament fibroblast viability. Dent Traumatol 2010;26:271–5.
2. Ashkenazi M, Sarnat H, Keila S. In vitro viability, mitogenicity and clonogenic capacity of periodontal ligament cells after storage in six different media. Dent Traumatol 1999;15:149–56.
3. Ashkenazi M, Marouni M, Sarnat H. In vitro viability, mitogenicity and clonogenic capacity of periodontal ligament cells after storage in four media at room temperature. Dent Traumatol 2000;16:63–70.
4. Olson BD, Mailhot JM, Anderson RW, Schuster GS, Weller RN. Comparison of various transport media on human periodontal ligament cell viability. J Endod 1997;23:676–9.
5. Marino TG, West LA, Liewehr FR, Mailhot JM, Buxton TB, Runner RR et al. Determination of periodontal ligament cell viability in long shelf-life milk. J Endod 2000;26:699–702.
6. Krasner P, Person P. Preserving avulsed teeth for replantation. J Am Dent Assoc 1992;23:80–8.
7. Hiltz J, Trope M. Vitality of human lip fibroblasts in milk, Hank's balanced salt solution and Viaspan storage media. Endod Dent Traumatol 1991;7:69–72.
8. Blomlöf L, Lindskog S, Andersson L, Hedström KG, Hammarström L. Storage of experimentally avulsed teeth in milk prior to replantation. J Dent Res 1983;62:912–6.