Effect of Iron deficiency anemia drugs on streptococcus mutants' activity

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Aim of the study

Knowing the fact that pediatricians prescribe different iron supplements for children suffering from anemia, it might be interesting to study the effect of common iron supplements products on the initiation of dental caries. Therefore, the aim of this in vitro study was to study the effect of four iron supplements on the initiation of dental caries.

Introduction

Caries development is associated with the ability of dental plaque to produce lactic acid and to dissolve minerals in teeth. Streptococcus mutans, lactobacilli, and other bacteria utilize lactic acid to create a low-pH environment. Glucosyltransferes (GTF) enzyme from Streptococcus mutans plays a very important role in dental caries and are considered the most significant virulent factor. Caries can continue throughout life so preventive measures must be a part of any treatment philosophy. Preventive methods may include fluoride, fissure sealants, dietary advice and patient education, as well as recall visits. Another possible caries preventive method is by using certain types of minerals. The results of some previous experimental studies concluded that when iron was mixed with cariogenic diet it reduced the incidence of dental careis in experimental animals. In addition, other studies found that iron decreases the caries development in the de-salivated rats. Moreover, it was reported that diet supplemented with iron salts, either in food or in drinking water may have AN inhibition effect on

Material and methods

Four products of iron supplements were used. These products were: (1) Fre-in-sol (Bristol Myers Squibb Company, New Jersey, USA), (2) Ferotonic (Ram Pharmaceutical, Amman, Jordan), (3) Feromin (Riyadh Pharma, Riyadh, KSA) and (4) Ferose (Spimaco Al Qassim Pharmaceutical Plant, Saudi Arabia). 120 extracted human teeth were distributed randomly into six groups (n=20). Four groups from the iron products, in addition to a Positive and a negative control groups. Mutants streptococci bacteria (6715) grown in Todd Hewitt Broth were used. Assessment of decalcification and cavitation by two examiners was done daily for 60 days. In this study, visual examination was used for the diagnosis of decalcification and dental explorer was used for diagnosis of cavitation (Tactile examination).

Results

All iron supplements have cario-static effect and delayed the initiation of the dental caries except ferose product. Proper inspection and examination for teeth in all groups revealed that the mean dates for decalcification varied, with lowest for the positive control (10 days) and the highest was for feromin. Cavitation was initiated in two groups; the negative control and ferose groups. The mean of the first day of cavitation was after 55 days.

Bibliography:

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Group number	Group name (n= 20\group)	Media (µl)		
		Bacteria	10 % Sucrose	Iron
First	Positive control	100	100	000[a]
Second	Negative control	000[a]	100	000[a]
Third	100% fre-in-sol	100	100	100
Fourth	100% ferotonic	100	100	100
Fifth	100% feromin	100	100	100
Sixth	100% ferose	100	100	100

Table 1: Distribution of teeth to experimental and control groups (total = 120 teeth).
[a] 100 ml dH2O.

Group number	Group name	Number of decalcified teeth	Means of the decalcified dates
First	Positive control	20	12
Second	Negative control	0	0
Third	100% fre-in-sol	2	29
Forth	100% ferotonic	3	45
Fifth	100% feromin	3	45
Sixth	100% ferose	16	35

Table 2: The descriptive statistics (number and mean) of decalcification date for all groups using visual examination after 60 days.

Group number	Group name	Number of decalcified teeth	Number of sound teeth	Percent of sound teeth
First	Positive control	20	0	00%
Second	Negative control	0	20	100%
Third	100% fre-in-sol	2	18	90%
Fourth	100% ferotonic	3	17	85%
Fifth	100% feromin	3	17	85%
Sixth	100% ferose	16	4	20%
overall		44	76	63.5%

Table 3: Number and percentage of sound teeth per group at the end of the study using visual examination.

Group	Name	Number of carious teeth	Means of the first day of cavitations	Percentage of remaining sound teeth %
First	Positive control	4	55	80%
Second	Negative control	0	0	100%
Third	100% fre-in-sol	0	0	100%
Fourth	100% ferotonic	0	0	100%
Fifth	100% feromin	0	0	100%
Sixth	100% ferose	1	55	95%

Table 4: The descriptive statistic (number and means) on the first day of cavitation and number and percentage of sound teeth using tactile examination. (*Experimental period = 60 days).

Conclusion& Recommendations

Some iron – supplement products have cario-static effect and delayed the initiation of the dental caries in human teeth. It is recommended to ask pediatricians managing anemic children to presc certain types of iron supplements that have double action, treatment of anemia and fighting teeth decay.