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The Fundamental Differences in Dental Anesthesia Duration Amid Patients Depending on Their Long Term Camel Milk Consumption

Research Article

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Abstract: The main aim of this study was to analyze the effect of Camel Milk (CM) consumption on the efficacy of local anesthesia for dental procedures. The patients were required local anesthesia before a dental procedure. A pilot study with a total number of twenty patients was subdivided into groups of ten. The first, control group was comprised of ten medically fit patients who had not consumed CM in their lifetime, while the second group consumed CM routinely. For the procedure, dental extractions were done in both groups first without CM drinking. The second time, the control and experimental group participants were asked to drink CM before anesthesia procedure for extraction. Each group was tested for sensitivity to anesthesia twice: after drinking the milk and before milk consumption. Both the control and experimental group were given CM one hour before the local anesthesia. There was a significant correlation between drinking CM and lowering anesthesia duration in the experimental group. The consumption of CM affected the duration of local anesthesia in the experimental group diferently compared to the control group. CM causes variation in the duration of local anesthesia in dental procedures. It has been changed exactly the opposite when drinking milk before using analgesics in different groups: shortened in those who usually drink milk, and lengthened in those who do not drink it daily. Further long-term studies with a larger sample size are required to conclude the findings.

Keywords: Camel milk; Dental extraction; Duration of anesthesia; Dental procedure; Hypothesis; Local anesthesia

Introduction

Camel milk is commonly consumed diary product in Arab countries. It is routinely consumed daily, as it is low in cholesterol and sugar, but high in minerals. It comprises protective proteins, such as immunoglobulins, lysozyme, β-lactoglobulin, lactoferrin [1,2], lactoperoxidase, etc. It is rich in panthotenic acid, folic acid, niacin and cobalamin. It is also pronouncedly high in vitamin C, while vitamin A and riboflavine is lower than in bovine milk [1,3]. As about vitamin C, its level is in average three times higher than that of cows milk [2]. The Camel milk is prooved to have antibacterial, antiviral, antifungal, antihepatitis, antiarthritic effects. These medicinal properties of Camel miilk have been published in literature as aiding in the treatment of paratuberculosis, prevention of aging, as a remedy for autoimmune diseases and has a cosmetic value [3,4]. Camel milk β-lactoglobulin is unique in terms of antioxidant factors. The insulin

in camel milk is safe and effective for improving long-term glycemic control in diabetic patients creating hypoglycemia. The other cited benefits are reduces autism symptoms in children; lactoferrin of camel milk has the ability to inhibit the cancer cells development and its rich magnesium, and zinc, content has anti-ulcer properties. The higher levels of iron content is believed to prevent osteoporosis and anemia. Camel milk contains a large amount of α-hydroxy acids, which make the skin smooth and is used to treat skin conditions such as eczema, psoriasis, different forms of dermatitis, acne, and so on [1,4]. Recently, a lot of scientific work has been carried out to improve understanding of ingredients action mechanism [4]. Camel milk comprises lactose composed oftwo sugars, namely glucose and galactose, which are fermented to lactic and pyruvic acid when milk goes sour [5]. It also includes fat that is considered to be small in quantity [6]. So, it is acknown that the camel milk differs from bovine in composition. Additionally, the fermentation and enzymatic hydrolysis of camel protein produce different types of bioactive peptides exerting different activity in In-vitro and In-vivo [7]. Furthermore, it does not cause cow milk intolerance reactions, as it has a significantly different chemical make up [8].

Few clinical trials have suggested vitamin C in high doses, that negates anesthesia in patients who consume camel milk [9].

In almost all dental applications it is possible to completely abolish pain during the procedure [10-13]. In dentistry, a wide range of ways and methods of local anesthetic blocks for the lower alveolar nerve is present [14,15]. Today, five local anesthetic drugs package for injection in dentistry are used; they include articaine, bupivacaine, lidocaine, mepivacaine, and prilocaine [16]. Since all these kind of anesthesia work in dentistry, the difference could be only in the duration of their action [17,18]. Evidence is clear that all known xenobiotics begin their path of detoxification in the liver with modification reactions as the hydroxylation reaction. In hydroxylation reaction converting hydrophobic compounds (which most anesthetics are) are converted into hydrophilic ones. As one of the components involved in hydroxylation reactions is vitamin C, which is involved in the process of microsomal oxidation and participates in the addition of a polar hydroxyl group to a number of compounds in the form of a coenzyme of hydroxylases, ergo its high doses in the blood and tissues of patient stimulates this type of reactions leading to early elimination of drugs with anesthetic and pain relief effect. The data available in the literature about the effect of camel milk on anesthesia are very contradictory, which requires additional researches in this direction.

For the reason mentioned above, it is usually necessary to tailor the technique chosen for the patient, the treatment to be performed and the particular skills of the team providing the treatment [10,12]. All methods of providing pain-free surgery are explained and the patient or guardian allowed giving informed consent to the ways of analgesia or anesthesia to be employed [18,19]. Thanks to camel milk irreplaceable properties, in some gulf countries, such as UAE, it is considered a traditional drink which is believed to be even the primary source of nutrition in UAE. Camel milk β-lactoglobulin is unique in terms of antioxidant factors, the insulin in camel milk is safe and effective for improving long-term glycemic control in diabetic patients creating hypoglycemia. Camel milk reduces autism symptoms in children; lactoferrin of camel milk has the ability to inhibit the cancer cells development. Camel milk is rich in magnesium, and zinc, therefore it has anti-ulcer properties. Calcium and far higher levels of iron in this nutrition is believed to prevent osteoporosis and anaemia. Camel milk contains a large amount of α-hydroxy acids, which make the skin smooth and is used to treat skin conditions such as eczema, psoriasis, different forms of dermatitis, acne, and so on [1]. In the other hand, world widely considers camel milk an enemy in medical field and dentistry due to its high concentration of vitamin C. Recently, a lot of scientific work has been carried out to improve understanding of ingredients action mechanism [4]. Camel milk comprises lactose composed of two sugars, namely glucose and galactose, which are fermented to lactic and pyruvic acid when milk goes sour [5]. It also includes fat that is considered to be small in quantity [6]. So, it is acknown that the camel milk differs from bovine in composition. Additionally, the fermentation and enzymatic hydrolysis of camel protein produce different types of bioactive peptides exerting different activity in In-vitro and In-vivo [7]. Furthermore, it does not cause the same sort of cow milk intolerance reactions, as it has a significantly different chemical makeup [6].

As it has already been mentioned above, camel milk is traditionally used in UAE population. Due to that it's vital to be aware of its effect on dental treatment amid this population.

Materıals and Methods

The research & Ethic Committee along with Ministry of Health and Prevention, Research Ethics Committee/RAK Subcommittee (MOHAP/REC/2019/37-2019-UG-D) have approved this research of RAK Medical Health and Sciences University (RAKMHSU-REC-83-2018-UG-D).

a.Inclusion Criteria: All patients were healthy with no history of excretory (kidney) and detoxification disorders.

b.Exclusion Criteria: All patients with congenital and acquired metabolic disorders, particularly with liver failure, were excluded, since the liver is the main organ responsible for the detoxifying non-self compounds in the body.

A pilot study with a total number of 20 patients who were subdivided into groups of 10 in each. The patients were 18 to 55 years of age that required a local anesthesia before a dental procedure. Of the total number of 20, the females were 7 and males 13. The first group of ten medically fit control group participants consisted of patients that did not consume camel milk in their lifetime. The second group was the experimental group, comprised of ten medically fit patients consumed camel milk routinely. Each group was tested for sensitivity to anesthesia twice: after drinking the milk and before milk consumption beforehand tooth extraction.

c.Procedure Done: In the first set, the dental extractions were carried out in both groups by ensuring that the patient had not drunk the camel milk for two days.An initial consent form was obtained from all the patients. They were informed of the research study in-depth and were allowed to clarify doubts. They were informed that the anesthesia time would be measured; and they were to fill the questionnaire provided after the procedure.Only patients accepting the explained procedure were involved in both phases of the study. Patients were prepared for dental extraction as per the protocol of infection control for extraction procedures. A sensitivity test was done for anesthesia before extraction. (An intradermal test with 1% lidocaine without preservatives was considered negative if no erythema, induration, blistering, and itching were observed 48 hours later).

In the second phase, the control groups who never drank camel milk and the routine camel milk drinkers also came for their second extractions. No instruction was given to stop camel milk for two days in routine camel milk drinkers. In the second phase the same, control and experimental participants, were given 280 ml of camel milk one hour before local anaesthesia. These patients were given pasteurized Camel milk as the Central Veterinary Research Laboratory in UAE informed us that raw camel milks illegal to be given. The full anaesthesia was standardized (only one cartridge of Lidocaine 2% + epinephrine 1:100,000), and the type of anaesthesia was infiltration. This research was done on 13 males and seven females. The total number of patients in this study was 20. From 50% of participants comprising the control group, 60% were male, and 40% female; 70%

of participants of the experimental group were male and 30% female. The previous protocols were followed. After extraction procedures, the co-investigators assessed the information filled by patients, the wear of anaesthesia was noted and time filled in.

The questionnaire was prepared in Arabic and English, as the visitors of RAK College of dental science were from different countries. Arabic speaking and non-Arabic speaking participants in the control group were randomly similar in number 50% for each sort. Still, in the experimental group, the Arabic - speaking participants were more than non-Arabic speaking: 60% Arabic speaking against 40% non-Arabic speaking. The co-investigator distributed the questionnaires to the patients to fill in. The effect and duration of anaesthesia were tested as in Baser MM et al. 2015 [2].

After the procedure, the patient was followed up to check the wear of anaesthesia duration before handing over the post-operative instructions.

A questionnaire subjective based survey about the duration of local anaesthesia was validated. The questionnaire included 11 questions, and the most significant were as following:

a. Demographic information

b. 2- Any previous experience with anaesthesia or extraction

c. 3- Previous experience with a duration of anaesthesia

d. 4-Any prior experience with camel milk

e. 5- Time of beginning to feel anaesthesia.

f. Duration of anaesthesia wear

The collected data were analysed with an excel sheet, and descriptive statistics were performed based on an excel sheet. The data were obtained using İBM SPSS version 26 with 95% confidence

Results

There was a very noticeable change from the basal anaesthesia duration in the control group (58%) and the experimental group (-51%). The control group showed a considerable shift compared to the experimental group, in which duration change was positive (+58%), i.e. prolonged. For comparison, in the experimental group the duration change after milk consumption was negative (-51%), i.e. decreased, showing that camel milk can indeed shorten or or lengthen the duration of anaesthesia depending on population type consuming/not consuming the camel milk. The mean of the control group anaesthesia duration without milk was 1.925 (hours) and with camel milk 3.05, which was significantly different. The mean of the experimental group anaesthesia duration without camel milk was 3.55 hours, and with milk 1.75, indicating significant lowering of anaesthesia efficacy in this group. The changes in the percentage within the control group was 58%, while on the contrary, in the experimental group -51%, showing the dependence of milk effect to anaesthesia on body reticuloendothelial system previous experience with camel milk: the percentage actually decreased due to camel milk drinking in the experimental group, but raised in the control group Ergo, the anaesthesia efficacy rate is different in these two group patients depending on their life experience with milk consumption (Figure 1-4).

Comparing the duration of routine anaesthesia without milk in the first and second groups, we may note that the basal lasting of anaesthesia is about 2 hours in the control group and nearly 3 hours and a half – in the second group. This data coin coil with data in other investigation, where the liver cytochrome P system was found to be supressed by camel milk components [3]. As the results have shown, there was a highly significant difference between the control and experimental group basal anaesthesia duration (without milk drinking before procedure) and after experiment with camel milk (with milk drinking before anaesthesia). We have statistically proved, that a camel milk significantly affects the duration of anaesthesia (correlation coefficient r = 0.838).

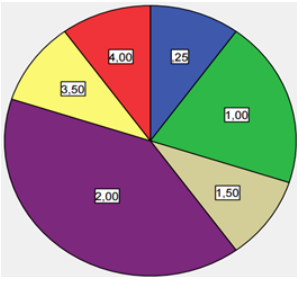

Figure 1: Distribution of patients without milk consumption before extraction according to the duration of anesthesia (in hours) in the control group. Mainly, duration in this case is within 2 hours.

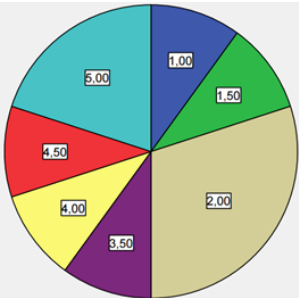

Figure 2: Distribution of patients according to the duration of anesthesia (in hours) in the control group in case of milk consumption before anesthesia. Mainly, duration after milk ingestion in this group is 2-5 hours.

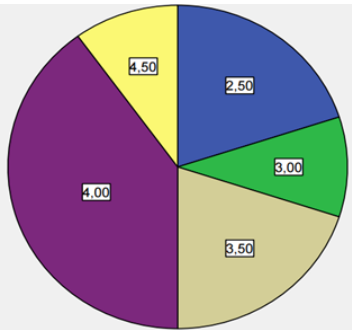

Figure 3: Distribution of patients without milk consumption before extraction according to the duration of anesthesia (in hours) in the experimental group. Mainly, duration is within 4 hours.

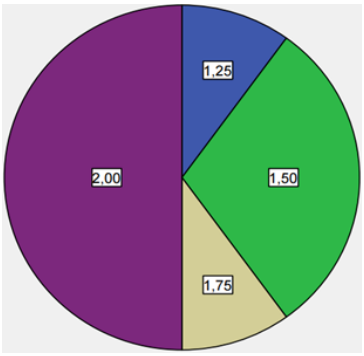

Figure 4: Distribution of patients according to the duration of anesthesia (in hours) in the experimental group in case of milk consumption before extraction; mainly, duration is within 2 hours.

The data on the correlation between the consumption of camel milk before the procedure and the duration of anaesthesia are also confirmed by the following. When comparing data patients without milk with data patients taking milk before the procedure, Pearson's chi-square was 63,333 and P <0.01 [21]. Therefore, doctors should bare in mind that drinking a camel milk before the procedure impacts the duration of the anaesthesia significantly.

As for procedure for extraction, it is of great importance for the patient how long the blockage of innervation lasts, on average the difference in the duration of anesthesia for each individually taken person is approximately hour and a half.

We note, that our results found out the negative correlation between constant milk consumption and anaesthesia duration in the experimental group: whenever the patient has been consuming camel milk for a long time, the anaesthesia duration is significantly lowered when drinking milk just before anaesthesia.

From the data above (Table 1),where the average of the anaesthesia duration amid control group patients in procedures without milk is 1,925 hours, it can be seen that the range is 3,75 hours, and the standard deviation is 1.13; so the data could vary somehow and deviate from the mean (Table 2).

Table 1: The main parameters of the control group patients who did not drink milk before anesthesia.

Without Milk (Control Group)			
Parameters		**Statistics**	**Standart Error**
Mean		1,925	0,35756
95,0 % Confidence Interval for Mean	Lower board	11,161	
	Upper board	27,339	
Mean Truncated by 5%		19,028	
Median		2,00	
Mode		2,0	
Sample Variance		1,278	
Standard Deviation		1.1307	
Minimum		0,25	
Maximum		4	
Range		3,75	

Table 2: The main parameters of the control group patients who took milk before anesthesia.

With milk (Control Group)			
Parameters		**Statistics**	**Standart Error**
Mean		3	0.47987
95% Confidence interval for mean	Lower board	19,645	
	Upper board	41,355	
Mean truncated by 5%		30,556	
Median		2.75	
Mode		2	
Sample Variance		2.302777778	
Standard Deviation		1.51749	
Minimum		1,00	
Maximum		5,00	
Range		4,00	

The Table 3 expresses the fact, that control group patients anaesthesia duration was mainly around two values: 2 & 5 hours.

Table 3: The anesthesia duration differences reliability due to use CM before tooth extraction in the control group.

Indicator	Value
t-statistic	3.148
DF	9
Significance level	P = 0.0118
95 % CI for mean	1.1166 to 2.7334

From the data in Table 4 given above it can be seen that the average of the anaesthesia duration in the control group patient's who took the milk before the extraction procedure is 3.05 hours, where the range is 4 hours, and the standard deviation is 1.5; so the data could vary and deviate from the mean.

Table 4: The comparison of main anesthesia duration parameters in patients who did not take milk and those who took milk before extraction in the control group.

Without milk/with milk control group	Mean	N	Standard Deviation	Standard mean
				Error
Without milk	19,250	10	1,13,070	0,35756
With milk	30,500	10	1,51,749	0,47987

The difference of the means observed in the control group with milk and without milk calculated with a significance value (P-value) and 95% Confidence Interval (CI) shows that the difference in anaesthesia duration is strongly confirmed (P is approximately 0.01)

Comparing mean & standard deviation in control group versus values without milk drinking, one may see the difference between the data in the anesthesia duration in control group depending on camel milk consumption: the time of duration is extended on average 1 hour.

The paired sample test shows that the difference between the means is -1.125 (the correlation is significant at the 0.05 level), this suggests that with a confidence of 95% we can say that a patient who does not have the habit of drinking camel milk, will have anesthesia for an hour longer than the standard time calculated for the pain killer.

From the data shown in Table 5 above we may see that the average of the anesthesia duration in the experimental group patients without having milk was 3.55 hours, with the range 2 hours, and the standard deviation was 0,685.

Table 5: The main parameters of the experimental group patients who did not drink milk before anesthesia.

Without milk (Experimental Group)			
Parameters		**Statistics**	**Standart Error**
Mean		35,500	0,21667
Confidence Level(95.0%)		0,4901340	
95% Confidence interval for mean	Lower board	30,599	
	Upper board	40,401	
Mean truncated by 5%		35,556	
Median		3,75	
Mode		4	
Sample Variance		0,4694444	
Standard Deviation		0,68516016	
Minimum		2,50	
Maximum		4,50	
Range		2,00	

From the data in Table 6 above it can be seen, that the average of the anesthesia duration in experimental group patients who have consumed milk before anesthesia for the extraction procedure, is 1.75hours (much less than without milk consumption) with the little range of 0.75 hours, and a little standard deviation that is 0.288.

Table 6: The main parameters of the experimental group patients who took milk before anesthesia.

With milk (Experimental Group)			
Parameters		**Statistics**	**Standart Error**
Mean		17,500	0,09129
Confidence Level (95.0%)		0,206505751	
95% Confidence interval for mean	Lower board	15,435	
	Upper board	19,565	
Mean truncated by 5%		17,639	
Median		1,875	
Mode		2,0	
Sample Variance		0,083333333	
Standard Deviation		0,288675135	
Minimum		1,25	
Maximum		2,00	
Range		0,75	

The difference of the observed means in the experimental group with milk and without milk shows that the difference in anesthesia duration is strongly confirmed (P < 0.0001).

From the Table 7 above we may clearly see the difference between the data of the anesthesia duration in the experimental group depending on camel milk consumption: the time of anesthesia is approximately halved after the consumption of the camel milk. with a 95% probability it can be said that anesthesia in patients who consume camel milk in their daily life will last approximately 1.8 hours less. The data in the Table 8 above indicate a significant difference (with P= 0.001) in the duration of anesthesia in patients do not using CM daily and those who include CM in their diet in the experimental group, confirmed also with Table 9.

Table 7: The duration of anesthesia differences reliability due to use CM before tooth extraction in the experimental group.

Indicator	Value
t-statistic	10,854
DF	9
Significance level	P < 0.0001
95 % CI for mean	3.1749 to 3.9251

Table 8: The comparison of main anesthesia duration parameters in patients who did not take milk and those who took milk before extraction in the experimental group.

Without milk/with milk (experimental group)	Mean	N	Standard Deviation	Standard mean
				Error
Without milk	35,500	10	0,68516	0,21667
With milk	17,500	10	0,28868	0,09129

Table 9: Comparison of the anesthesia duration in the control and experimental group patients without milk intake before tooth extraction.

Difference	1.625
Standard error	0.418
95% CI	0.7471 to 2.5029
t-statistic	3.889
DF	18
Significance level	P = 0.0011

Discussion

The results showed a robust correlation between the camel milk single-time drinking or the lifelong consumption and anaesthesia efficacy. We found out that the duration of anaesthesia after camel milk drinking was lowered for more than 80% in patients with long life camel milk consumption, re-confirming Dr. Hinkle and other researches' previously published data in this field [10].

When the anesthesia duration after milk drinking were measured, we found out that created by lidocaine 2% + epinephrine 1:100,000 mixture anaesthesia [22,23] had been lasting for 1.25-2 hours, what was opposite to Dr.Stanley, Dr.Sean and Dr.Paulon ideas, who constatate that it is usually lasting around 1-5 hours [14,18].

As may be seen, the scientists around the world are trying to understand the reason for the differences in patient response to anaesthesia when it comes to drinking milk, but to no avail. We were able to establish a significant difference in the direction of changes after using camel milk. After drinking a camel milk before anaesthesia, the duration of the analgesic effect changes in two directly opposite directions: for those who drank milk for the first time before anaesthesia, the duration of the drug's action is prolonged. And vice versa, for those who drank milk constantly and additionally took it before anaesthesia, the time of anaesthetic effect is reduced. So we state that there is a very strong correlation between: on the one hand, the camel milk single-time drinking and anaesthesia efficacy, and on the other hand, the lifelong consumption and anaesthesia duration. From this pilot study, it was observed that the duration of anaesthesia after camel milk drinking was lowered by more than 80% in patients with daily life-long camel milk consumption, what re-confirms Dr.Hinkle and other researches data in this field. The reason for decreased anaesthetic effect in camel milk consuming patients may be explained by the relatively high dose of vitamin C in camel milk leading to early detoxification of lidocaine by modification of its structure with hydroxylases. The average 3.55 hours duration of anaesthesia in this group of patients demonstrates significant lifelong suppression of their microsomal oxidation system. Results obtained by Ibrahim Z. and co-authors showed, that camel milk suppresses the mRNA expression of CYP1A2, CYP3A2 and CYP2B1, that participate in modification and detoxification of xenobiotics. The authors also state, that camel milk supplementation down regulates hepatic CYP3A2, CYP2B1, CYP1A1 and CYP1A2 mRNA expressions [24]. The authors assume that through this suppressive effect,a camel milk has a potential anticancer effect due to procarcinogens to carcinogens activation prevention. However, there are some mechanisms in this system that gets used to working in tension mode, which helps it to accelerate significantly in the presence of 280 ml of milk. Most likely, the real reason for the sharp decrease in the duration of the anesthetic action in patients who use camel milk a daily basis is high dose of vitamin C present in camel milk. It is acknown that vitamin C may perform hydroxylation reactions by pathway different from microsomal oxidation, which is why most probably modification of pain killer (lidocaine) was made earlier after drinking milk in the second group, which is used to consuming camel milk. As for the control group, their microsomal systems work as usual, without suppression, leading to relatively early modification of anesthetic, which is why we observe that the anaesthesia duration has been lasting for 1.925 hours. When camel milk is given just before anaesthesia to patients not in the habit of camel milk consumption, the suppressive action of peptides on the cytochrome system has not been manifested yet, as it takes a longer duration to achieve this manifestation. Therefore, the reason of prolonged anaesthetic circulation in the blood and its action in the control group after camel milk consumption is, most probably, the action of some milk components on the detoxification system not at the mRNA level, but by the blockage of some enzyme systems way, as the control group enzyme systems are not accustomed to contact with new milk protein components. This is akin to an allergic reaction [25], when a new allergen entering the body triggers the body's defense systems against itself, ergo the other foreign components may freely manifest their activity. The inhibition of drug detoxification and decrease in its elimination after camel milk ingestion in such kind of population (not drinking camel milk daily) occurs not at the level of gene repression, but at the level of inhibiting enzyme systems. This is the most putative mechanism of camel milk action on analgesics activity.

As per our results, they successfully re-confirmed, that there was a significant effect of camel milk on the anaesthesia, as stated by Dr. Hinkle. Our studies also prove the effect of camel milk on anaesthesia, but we state that camel milk may reduce or increase the duration of anaesthetics action depending on person's enzyme system preliminary contact with this milk. Since the duration of basal anaesthesia was quite long in the experimental group, in which the people drink camel milk constantly, we suggest that this fact is due to presence in camel

milk the components, that impact on the liver cytochrome system activity. as it is described in Ibrahim Z. et al. work: they are reducing cytochromes mRNA expression [24]. When an analgesic is injected into the body of such a patient, it is difficult to assume that a decrease in the duration of the analgesic effect is the result of cytochrome gene expression stimulation, since this usually takes hours, and sometimes days. Therefore, a really probable reason for the reduction in the duration of anaesthesia in the experimental group may be the high concentration of vitamin C in their body, achieved after many years of camel milk use. Since in the body of patients who do not consume camel milk initially, before they use milk one-off time, anaesthesia has lasted for significantly less hours than in the second group, it can be assumed that this is most likely the result of more active work of their cytochrome microsomal systems. Perhaps after drinking milk, in the body of such patients, some component of milk blocks the detoxification system, which is why the duration of anaesthesia in them lasts much longer than in the second group after drinking milk. There is clear evidence of the dual effect of camel milk on patients. Those accustomed to drinking milk, accumulate vitamin C in high concentrations in the blood, what helps them to quickly modify and eliminate chemical reagents, including anaesthetics, which leads to a shortening of the duration of anaesthesia in them after milk drinking. However, those who do not consume milk in everyday life react to it as to an allergen, which leads to a decrease in the activity of protective detoxifying enzyme systems and a delay in eliminating of the pain reliever from the body, followed by prolonged anaesthetic action. As is obviously seen from this study, we need to highlight the importance of dealing with patient who are camel milk consumer with cautious. Without any doubt, we have identified significant deviations from the generally accepted data in the duration of anaesthesia, which require further research to identify the detailed mechanism of these deviations on enzyme systems.

Conclusion

Though many reports of camel milk effect on general anaesthesia have been cited, no clear literature on dental anaesthesia have been reported. This article highlights the significance of changes that are possible in dental anaesthesia due to camel milk consumption continuance. Without milk consumption before anaesthesia, analgesic effect is significantly longer in the group of patients constantly using camel milk. After drinking camel milk before anaesthesia, the duration of anaesthesia changes both for those who use it daily and for those who drink it for the first time. It has been changed exactly the opposite when drinking milk before using analgesics: shortened in those who usually drink milk and lengthened in those who do not drink it.

Hence the authors recommend that a dietary history be taken before procedures requiring local anaesthesia. Further long-term studies with more sample sizes are necessary to reveal the molecular mechanisms of this phenomenon.

Findings

Despite the many works devoted to the impact of camel milk consumption on anaesthesia, we observed a pattern in the difference of camel milk effect depending on its consumption frequency throughout life; simultaneously, we offer a possible explanation for this phenomenon.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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