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РЕАБИЛИТАЦИЯ КОСТНЫХ ДЕФЕКТОВ НЕБОЛЬШИХ АМПЛИТУД ПРИ ПОМОЩИ ИМПЛАНТОВ

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Аннотация:

В этой работе анализируется сложность проблематики востановления костных дефектов небольших амплитуд и применение специальных терапевтических возможностей для их реабилитации. Полученные результаты демонстрируют что терапевтический ареал должен сумировать основные принципы реабилитации с разными методами и типами ртезирования. Специальную роль в этом играют использованные материалы, которые выбираются в соответствии с клиническими особенностями каждого пациента, биоматериалы такие как: Bio-Oss,Cerasorb,Grafton si MBCP .

Ключевые слова:

имплантация, костных дефектов, принципы реабилитации, протезирование, биоматериалы

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DYNAMICS OF LACTATE DEHYDROGENASE CATALYTIC ACTIVITY UNDER THERMOMODIFICATION

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Abstract:

Catalytic activity and kinetic characteristics of the rats (Wistar line) hepatic lactate dehydrogenase before and after thermodenaturation (15 minutes, 60°C) were studied. We found out that the enzyme thermodenaturation brings to activation of the direct and inhibition of the back lactate dehydrogenase reactions . This is confirmed by the enzyme activity rate and kinetic characteristics.

Key words:

Lactate dehydrogenase, thermodenaturation, spectroscopy

Modern combustiology is predominantly a clinical discipline while fundamental basis of thermal trauma forming mechanisms and molecular aspects of burn disease pathogenetic therapy are not adequately explored [3]. A significant moment of thermal lesions pathogenesis is disturbance of supramolecular enzymatic cellular complexes functioning [4]. Moreover it is necessary to say that a distinct toxemia which is a considerable component of burn disease, brings into changes of enzyme activity including lactate dehydrogenase. As a result accurate definition of this enzyme functional activity changed character under thermal effect is fundamental from the theoretical and applied positions.

In connection with it our research aim was study of rats hepar lactate dehydrogenase catalytic characteristics under thermal effect in vitro.

Materials and methods

Catalytic activity and kinetic characteristics of lactate dehydrogenase (LDG) were studied. In the research we used hepatic LDG of white laboratory male rats (Wistar line) with weight of 180-200 grams. 1 g of hepatic tissue cut very small, homogenized in 10 ml of distilled water and centrifugated for 15 minutes under 6000 turns per minute. We threw away a sediment and determined enzyme activity in supernatant.

Enzyme activity was determined spectrometrically by using as a substratum lactic acid (for the direct reaction) [1]. Enzyme activity in the back reaction was also determined spectrometrically by using methylsuccinic acid as a substratum. LDG activity was evaluated in nanomole (nmole) of nicotinamide-adenine dinucleotide reduced disodium salt (NADH) in 1 minute per 1 protein mg. Then we made thermomodification of the supernatant. The protein solution was put in thermostat for 15 minutes (under 60ºC) and after that was cooled for 15 minutes. Afterwards enzyme activity was determined again.

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Table 1

Activity and kinetic characteristics of lactate dehydrogenase under its thermomodification

Index	Before thermodenaturation		After thermodenaturation	
	Direct reaction	Back reaction	Direct reaction	Back reaction
Activity, nmole/min×protein mg	16,74±4,90	98,65±8,97	42,84±6,51*	26,38±7,07*
K_t, min	4,89±1,74	2,24±0,77	0,79±0,31*	13,70±6,40*
V_{max}, mkmole/min	1,98±0,87	3,64±2,34	0,91±0,86*	16,80±8,80*

Note: significant distinctions with the starting exponents p<0,05 – ""*

We studied kinetic characteristics of the lactate dehydrogenase reaction (time of substratum half reaction - Kt – and rate of reaction products accumulation - Vmax) which were calculated by Kostir formulas [2]. Statistic processing of the data was accomplished by Microsoft Excel 2003 spreadsheets and program Primer of Biostatistics Vers. 4.03.

Results

LDG catalytic characteristics dynamics under thermomodification was evaluated by the above mentioned kinetic characteristics (time of substratum half reaction and rate of reaction products accumulation) and enzyme activity (table 1).

It was determined that the activity of the direct reaction catalysed by the enzyme, increased significantly from 16,74±4,90 nmole HADH/min×protein mg (starting level) to 42,84±6,51 nmole HADH/min×protein mg (after thermal treatment) (p<0,05). There was an inverse tendency concerning the back reaction – significant reduction of LDG activity (from 98,65±8,97 nmole HADH/min×protein mg to 26,38±7,07 nmole HADH/min×protein mg accordingly) (p<0,05). It should be mentioned that significant distinctions were marked for all kinetic characteristics.

We calculated time of substratum half reaction (K_t) and maximum rate of reaction products accumulation (V_{max}) of the lactate dehydrogenase reaction for the mechanism specification of the enzyme activity revealed dynamics. Based on

the calculations we determined that K_t varied from 4,89±1,74 min (starting level) to 0,79±0,31 min (after thermal treatment) (table 1), Vmax – from 1,98±0,87 mkmole/min to 0,91±0,86 mkmole/min accordingly ($p<0,05$) for the direct reaction. In the back reaction K_t changed from 2,24±0,77 min to 13,70±6,40, and V_{max} – from 3,64±2,34 mkmole/min (starting level) to 16,80±8,80 mkmole/min (after thermal treatment) ($p<0,05$).

Conclusion

Analysed the findings we ascertained that simulated thermodenaturation (15-minutes` exposure under 60ºC) brought into acceleration of the lactate dehydrogenase direct reaction and fall back of the back reaction. Such a conclusion was made on the basis of the enzyme catalytic activity kinetic characteristics research and study of the direct and back reactions products accumulation process. Uncovered enzyme catalytic activity changes under thermal effect brought into increase of LDG affinity to lactic acid and promoted methylsuccinic acid accumulation.

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ДИНАМИКА КАТАЛИТИЧЕСКОЙ АКТИВНОСТИ ЛАКТАТДЕГИДРОГЕНАЗЫ ПРИ ТЕРМОМОДИФИКАЦИИ

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Аннотация:

На основании тезиокристаллоскопического и спектрометрического (при длинах волн в диапазоне 300-400 нм) анализа кристаллов слюны и промывных вод кишечника 12 практически здоровых лиц и 12 пациентов, получающих ректальные ирригации озонированного изотонического раствора хлорида натрия были установлены особенности свободного кристаллообразования данных биосубстратов. Показатели кристаллогенеза биоматериала оценивались после однократного воздействия и по окончании полного курса процедур. Установлено, что однократное ректальная озонотерапия и курсовое лечение разнонаправлено изменяют свободный кристаллогенез слюны и промывных вод кишечника .

Ключевые слова:

слюна, копрофильтрат, кристаллогенез, спектрометрия

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THE FINITE ELEMENT TECHNIQUE IN THE ANALYSIS THE DENTAL IMPLANT BIOMECHANICS

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Abstract:

The complexity of the forces which act on the dental implant, in the stomathognatic system environment can have miscellaneous consequences on the periimplantar tissues, the implant length and diameter being mainly considered critical factors in achieving and maintaining osseointegration in optimal parameters. The finite element analysis technique purpose is to reveal the influence of the geometrical parameters and to establish which one ensures the most proper distribution of the stress over the implant-bone surface.The simulation was realized for cylindrical, solid and non-threaded implants made of titan. I have chosen three different lengths for the embeded endosseous implant and three different diameters The finite element technique indicates a more effective impact of the diameter in reducing the effects of the masticatory forces applied comparing to the length of the implant.

Key words:

periimplantar tissues, length and diameter, finite element technique, osseointegration

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ИССЛЕДОВАНИИ БИОМЕХАНИКИ ДЕНТАЛЬНЫХ ИМПЛАНТОВ МЕТОДОМ КОНЕЧНЫХ ЕЛЕМЕНТОВ

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Аннотация:

Комплексные и атипичные силы которые взаимодействуют на импланты играют важную роль на периимплантарные ткани. Длинна и диаметр имплантов считаются как критические параметры, которые влияют на успешность остеоинтеграции в оптимальных параметрах. Роль анализа методом конечных елементов исследовать который из выше указанных параметров распространяет более уравновестно силы и стрес на уровне костно-имплантатного соединения. Результаты показывают что диаметр имплантата имеет более уравновешенную способность распределения сил в отличии от длинны.

Ключевые слова:

анализ методом конечных елементов, длинна и диаметр имплантов, остеоинтеграция

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