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BANJA KOVILJAČA'S SULPHURIC PELOID
APPLICATION IN CHILDREN

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PRIMENA SUMPOROVITOG PELOIDA
BANJE KOVILJAČE KOD DECE

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Abstract

Key words

Banja Koviljaca, peloid, children

Ključne reči

Banja Koviljača, peloid, deca

Sulphuric mud from Banja Koviljaca has been used in the treatment of various disorders of locomotor system in children, due to its great scientifically approved therapeutic possibilities. Empirical knowledge has been used as well.

THE AIM of this work is to present therapeutic effect of sulphuric mud from Banja Koviljaca in the management of disorders and injuries of locomotive system in children.

Peculiarity of sulphuric peloid from Banja Koviljaca comes from its high heat capacity which depends on the grain size, low heat conductivity and chemical effect of the sulphur. The peloid has been applied directly on the skin after "ripening", as local application at 38-40°C, as 4 cm layer, for 20 minutes, and followed by kinesiotherapy.

The KINESIOTHERAPY IN PELOID, providing extraordinary results, has also been applied.

Indications for using peloid in children are: anomalies and deformities of locomotive system, bone and joint deviations, aseptic necrosis, epiphysiolysis (prior to and post surgery), developmental hip disorders, polytrauma, peripheral nerve lesion, rheumatic disorders in remission phase, milder forms of cerebral palsy etc.

Contraindications for using peloid in children are: age under 3, neuro-muscle disorders and dystrophy, malignant diseases, rheumatic diseases during exacerbation, coagulation disorders, thyroid gland disorders etc.

Sulphuric peloid from Banja Koviljaca yields excellent results in the treatment of some disorders and injuries of locomotive system in children.

INTRODUCTION

The children rehabilitation is the young branch in medical science which due to natural causes distinguished itself from the physical rehabilitation and medicine.

The children rehabilitation in Serbia is not at considerable level and it needs further development and modernization.

The standard physical agents have been used in rehabilitation of children, and the application of sulphuric peloid is poorly understood and limited only to rehabilitation centers where it can be found.

The number of published scientific papers concerning this field is very small in the world, and there are not many papers in Serbia, either.

The favor of rehabilitation center, *i.e. SULPHURIC PELOID, balneological potential, and mineral water*, many years' experience in work with adult patients, staff structure and supply for work with children, all influenced on decision about children rehabilitation in Banja Koviljača.

The initiators of the idea and realization of children rehabilitation program in Banja Koviljača were: Prof.Dr.Dragiša Rakić, children surgeon and a general manager of the Clinic for Children in Belgrade at that time, Prof. Dr. Gordana Nikolić, professional manager of children rehabilitation at the Clinic for Children in Belgrade in cooperation with Dr. Nikola Sremčević – sub specialist in children physical rehabilitation and medicine, the general manager of Specialized Hospital for Rehabilitation Banja Koviljača, and Dr. Negosava Stojković – sub specialist in children physical rehabilitation and medicine with associates.

The Children Rehabilitation Department in Banja Koviljača started to operate on March 1st, 1989.

Since team work is necessary in children rehabilitation (children physiatrist, physiotherapist, children orthopedist, surgeon, neurologist, somatopedist, speech therapist, psychologist, social worker and others), we are in cooperation and under professional supervision of the Institut za majku i dete (the Institute for Mother and Child) IOHB "Banjica" (the Institute of Orthopedic Surgery "Banjica") in Belgrade.

Operating in this way provides universal approach and course of children rehabilitation, which provides very good results.

Since this is the first Department for children rehabilitation of locomotive system in Serbia, it is necessary to emphasize the significance of such specialized work and its contribution to treatment of children with its tendency to expand and modernize.

THE HISTORY OF THERAPEUTIC APPLICATION OF PELOID

Peloid is a Greek word (*pelos* – mud, mire), meaning “mud bath”, and its application is called “peloidotherapy”. At recommendation of International Society of Hydrogeology, this term has been used since 1937.

There are many definitions for peloid, but in our country Štraser and Godić's definition is accepted: “Peloid is a geological product made of inorganic and/or organic substances which may be used for the treatment in the form of bath or coating.”

We may learn from the papyrus scripts written 4000 years ago that the Egyptians used peloid in cases of burns, joint contractures, some paralysis, female diseases and other conditions, and as Gallen reported they were taking mud out of the Nile.

Romans also had highly developed bath cult and they introduced peloid baths.

For peloid baths, they used peloids of different origin soaked with hot SULPHURIC or ferrous water.

The first instructions for peloid application were written in 16th century, containing the list of diseases in which it can be used, treatment duration, application method and other.

The first descriptions and analyses of peloid in our country refer to lake mire from Banja Rusanda (Dr. Schneider, Vienna, 1866).

At the beginning of 19th century, comprehensive investigations of physical characteristics, chemical structure and biological effects of peloid were written down.

In 1920's, a special committee for peloid at International Society for Hydrology was formed.

DIVISION AND CLASSIFICATION OF PELOID

Peloids may be natural and artificial.

The NATURAL peloids are formed by depositing more or less decayed, rotten, overripe, organic and inorganic substances in bayous, sea lagoons, saltwater and freshwater lakes, rivers, marshes, mineral water spring mires and in volcanic areas.

Originating is related to biological, physical and chemical processes of decaying.

There are wet and dry peloids, and they are used as found in the nature. They are prepared for application in a way which will not change their physical and chemical properties.

The **ARTIFICIAL** peloids are refined peloids, i.e. natural peloids that are refined and significantly changed before their use.

The artificial peloids are mostly used out of establishments.

According to their origin, peloids are classified into following groups: **organic (bioliths)**, **inorganic (abioliths)** and **mixed organic – inorganic**.

The ORGANIC PELOIDS comprise those peloids consisting of over 10% of organic substances.

The organic peloids are products of rotting upper and lower plants, algae and bacteria, while humus and peat are formed. The most common inorganic components are diverse kinds of clay, marl, limestone, sand and mineral water salts which peloid is impregnated with. The organic peloids include:

- peat (peat soil, elevated and leveled peat)
- organic mud (bitumen mud, sapropel and gultya)

The **INORGANIC PELOIDS** comprise:

- mineral peloids (clay, loam, tufa)
- volcanic peloids

PELOID DIVISION ACCORDING TO pH VALUE

1. Ultra acid peloids, if their pH is less than 2.5
2. Acid, if their pH value is 2.6 – 5.0
3. Weak acid, if their pH value is 5.1 – 7.0
4. Weak alkali, if their pH value is 7.1 – 9.0
5. High alkali, if their pH value is more than 9.0

CHEMICAL STRUCTURE AND PHYSICAL PROPERTIES OF PELOID

CHEMICAL STRUCTURE

Peloids consist of **WATER, INORGANIC AND ORGANIC SUBSTANCES**.

Water contents ranges from 23% to 92%, and percentage elevates going from mineral peloids to peat. It is a structural part of PELOID SOLUTION, i.e. peloid LIQUID PHASE, which is, apart from water, made of electrolytic dissociation, iron salts, aluminium, calcium and magnesium hydro carbonate, oligoelements, gases and biologically active substances.

Peloid solution is the most movable, and therefore it is the most active in a sense of therapeutic treatment. The substances which are in peloid solution have stimulating effect on the skin, they may penetrate and go through it.

In addition to peloid solution (liquid phase), peloid structure includes SOLID PHASE made of:

1. Crystal framework (peloid skeleton)
2. Colloid complex

The PELOID SKELETON is a firm basis or so called “SKELETON” of peloid matter which consists of particles, sized 1 m.micron, of diverse origin, mainly calcium and magnesium carbonates, sulphates and phosphates.

The peloid skeleton determines its mechanical structure, i.e. the size of particles, and the quality of peloid depends on it.

The peloid skeleton differs by mechanic (grain) and mineral composition. Since plasticity of peloid is important, it is preferable that sharp particles with diameter of 10-100 mill microns forms most of it.

Too much thin peloid composition makes it too soft, liquid and unusable for peloid application.

The COLLOID COMPLEX is a plastic hydrophilic basis which absorbs moisture and defines thermal properties of peloid.

The colloid complex consists of inorganic and organic components. Inorganic component consists of iron hydrosulphide and iron hydroxide, aluminium hydroxide and silicon acid colloids.

The organic component of colloid complex is made of huminic and fulvous acid and their salts.

The colloid complex provides specific coexistence of peloid and largely defines its thermal properties.

Inorganic substances in peloid come from the soil in which peloid originated, and amount, kind and structure depend on geological soil formations.

The amount of inorganic substances in peloid rises from peat to mineral peloids.

The **ORGANIC SUBSTANCES** are made of decayed parts of plants and animals, and more or less decayed products of their metabolism. The amount of organic substances decreases from peat to mineral peloids. Peat contains bitumen (soluble in benzol alcohol) which consists of wax, resin, carbon hydrates, fat, spropelenine, pectin, humin fulvous acid as products of humification.

PHYSICAL PROPERTIES OF PELOID

The most important physical properties of peloid are: absorption, plasticity and viscosity.

Capacity to bind water is presented in how many grams of water bind one gram of peloid at room temperature with exclusion of evaporating. When peloid binds the highest amount of water it can bind, it is in the state of normal solution and is used for application as such.

Mineral peloids do not have great possibility to swell, for peloid with smaller particles binds more water.

Specific peloid temperature is amount of heat needed to warm up one gram of peloid by one degree.

Thermal capacity is specific heat of 1cm³ of peloid, i.e. specific heat multiplied with density.

Quotient of peloid thermal conductivity presents velocity of transferring heat energy from the heated to cooler part of some body. If the quotient is higher, heat goes faster through the body. Thermal conductivity is the highest in mineral peloids, and inorganic peloids are better conductors than organic.

The organic peloids conduct heat better if their water content is higher, while it is otherwise in the case of inorganic peloids – higher water content causes poor conductivity.

BIOLOGICAL EFFECTS OF PELOID

Biological effects of peloid on human body are determined by their physical properties, particularly thermal and mechanical ones.

Peloids have high thermal capacity, but low heat conductivity and convection ability, and they are counted as good thermotherapy material.

Treatment properties of peloid are related to swelling and wet condition, which determines thermal properties of peloid, light and uniform transfer of heat from peloid into tissue.

The **THERMAL EFFECT** is demonstrated by local hyperemia of body exposed to hot peloid, improved blood

circulation, improved metabolic processes which all lead to lessening muscle spasm and relieving pain, and by that to accelerated resorption of infiltrates of different genesis.

The analgesic effect, evident at peloid therapy application, comes as a result of heat action toward nerve ends, resorption of efflux in infiltrated tissue, faster pain mediators shunting (Bradikinin et al.) and in that way tissue tense is lessened.

The **MECHANICAL EFFECT** is determined by viscosity of peloid, and powered by its heat. During rest, it causes straining joints and muscles, and during movements completely specific resistance.

At mud packs there is only downward pressure of peloid mass, and it depends on the width of pack and specific weight of peloid.

Mechanical pressure and thrust (in baths) act on deep blood and lymphatic vessels, leading to significant changes in the flow.

The **CHEMICAL EFFECT** of peloid has not been satisfactorily investigated yet, and it is known that it depends on pH value of peloid.

Alkali peloids make skin permeable to cat ions, and acid ones for anions.

It has been established that following substances penetrate from peloid suspension into skin: **sulphur, sulphur-hydrogen**, iodine and some of iron compounds.

Sulphur is known for penetrating through undamaged skin in some of its forms. Those are: sulphur-hydrogen in mineral peloids and bayous, bisulphides and fine dispersed elemental sulphur in peat and silt.

The contact between skin and peloid with diverse electrolytes leads to changes in electrical potential in the skin. It is evidenced that there is electrolytic exchange between skin and peloid when absorption power of peloid is expressed.

The chemical effect of peloid comes as a result of absorbing mineral substances by skin, exciting these substances on the skin itself or induced sensory visceral reflexes.

The **PHYSIOLOGICAL EFFECTS** occur as a result of mechanical, thermal and chemical activity of peloid. The most common are: rising local and central temperature, high pulse rate, lowering artery tension, improving circulatory debut, tachypnea, more intensive metabolism of phosphorus, lipid, proteins, and vitamins, enhanced activity of proteolytic ferments and ferments of tissue respiration which also improves.

Peloids regulate neurovegetative balance and act sedatively resulting in good mood of beneficiary.

Peloid has specific effect related to diverse peloid components in ion and dissociation form. These effects comprise: activating glycocortical function of adrenal gland and rising 17-OH and ketosteroids in plasma, limiting tissue and cellular reaction to some inflammatory mediators (serotonin, bradykinin-kinin), weakening anaphylactic reaction to foreign proteins, increasing hyaluronic acid content in joint capsule and chondroitinsulphuric acid in cartilage as well as lowering effects of hyaluronidase.

These effects are particularly investigated in cases of rheumatoid arthritis, and therefore peloid application in chronic phase of this disease is considered as one of the basic treatments.

As a result of all these reactions, following therapeutic effects of peloid are achieved:

The Institute for Rehabilitation
Balneoclimatology Office
Belgrade, Sokobanjska 17

Banja Koviljača – well BK-1A

Date of analysis: 21/10/2005 Analysis done by: Dr Sc.med Dr. Rosa Mihajlović	Specific gravity: 1.0034 g/cm ³ pH: 6.54 dry residue at 180°C 0.8050 g/l water temperature: 29.1°C air temperature: 22.0°C
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1 liter of water contains

CATIONS:	Grams	mill moles	millival	millival%
Sodium (Na ⁺)	0.1820	7.9130	7.9130	44.7252
Potassium (K ⁺)	0.0209	0.5358	0.5358	3.0284
Lithium (Li ⁺)	0.00251	0.3585	0.3585	2.0263
Ammonium (NH ₄ ⁺)	<0.00005	-	-	-
Calcium (Ca ⁺⁺)	0.1129	2.8225	5.6450	31.9062
Magnesium (Mg ⁺⁺)	0.391	1.6090	3.2180	18.1884
Strontium (Sr ⁺⁺)	0.00098	0.0111	0.0222	0.1255
Manganese (Mn ⁺⁺)	<0.00001	-	-	-
Iron (Fe ⁺⁺)	<0.00001	-	-	-
Aluminium (Al ⁺⁺⁺)	<0.00005	-	-	-
			17.6925	100.0000
ANIONS:				
Hydro carbonates (HCO ₃ ⁻)	0.7810	12.8032	12.8032	76.6127
Chloride (Cl ⁻)	0.1035	2.9154	2.9154	17.4453
Bromide (Br ⁻)	<0.0005	-	-	-
Iodide (I ⁻)	<0.0005	-	-	-
Iodide (J ⁻)	0.00094	0.0494	0.0494	0.2956
Fluoride (F ⁻)	<0.0005	-	-	-
Nitrate (NO ₃ ⁻)	<0.00001	-	-	-
Phosphate (HPO ₄ ⁻⁻)	0.0453	0.4718	0.9436	5.6464
Sulphate (SO ₄ ⁻⁻)				
			16.7116	100.0000
WEAK ELECTROLYTES:				
Metasilicon acid	0.0249			
Metaboron acid	0.0180			
SUM OF ALL SOLID DISSOLVED INGREDIENTS:	1.3320			
GASES:				
Free carbon-dioxide (CO ₂)	0.2112			
Free hydrogen-sulphide (H ₂ S)	0.01207			
CHEMICAL CHARACTERISTICS	Chemical structure of water is characterized by: sodium, calcium, hydro-carbonates Total concentration N/1000 34.40: Na 7.91: Ca 5.64: HCO ₃ 12.80 Water is characterized by presence of free hydrogen-sulphide (H ₂ S 0.01207 g/l)			
KURLOV FORMULA	H ₂ S 0.0120 M 1.33 $\frac{\text{HCO}_3}{\text{Na 44.72 Ca 31.90}}$ T 29.1°C			
Category	Water belongs to sodium, calcium, hydro-carbonate and highly sulphide hypotherm category.			

- pronounced and long-lasting vasodilatation
- improved local blood or lymph circulation
- accelerated resorption of pathology products and edema

- improved trophic
- accelerating regenerative processes
- analgesic effect and
- spasmolytic effect in enhanced muscle tone.

BANJA KOVILJAČA'S PELOID

Banja Koviljača's peloid is a product of nearby clay and BK-1A hydrothermal mineral water well of Banja Koviljača.

BANJA KOVILJAČA'S MINERAL WATER

Mineral water from BK-1A hydrothermal well in Banja Koviljača is sodium, calcium hydro carbonate and highly sulphide hypotherm, with spring temperature of 28°C and pH value of 6.5.

Banja Koviljača's mineral water is highly sulphide – 12 mg/l of dissolved hydrogensulphide. It is known that free H₂S is toxic for respiratory system by binding ferments necessary for cell respiration. Moreover, it does not make compound with hemoglobin, but poisoning comes as a result of blocking respiratory center with concentration of 5%.

From analysis of mineral water from BK-1A hydrothermal well in Banja Koviljača, it can be noticed that free hydrogensulphide content is 0.01207 g/l.

Due to free H₂S and its toxicity on respiratory system, whose maximum allowed concentration is 0.02%,

Banja Koviljača's mineral water is not used in the treatment of children.

However, there are other balneological potentials which found adequate and important use in the treatment of children.

Balneotherapy has always been used most in management of diseases and injuries of locomotive system which is the most important factor for man's activity and functional operations.

There is tendency for avoiding aggressive treatment modalities in modern medicine, especially those which lead to severe complications, and from that reason it is necessary to use non-invasive agents, particularly those not causing complications and without contraindications.

We use natural factors in balneotherapy, hence biological, physiological and non-invasive factors, and by that we are getting a chance for better results.

When children, diseases and injuries of locomotive system are in question, one of NATURAL AND NON INVASIVE AGENTS IS SULPHURIC PELOID USED IN MANAGEMENT OF THESE CONDITIONS.

BANJA KOVILJAČA'S SULPHURIC PELOID SPECIFIC FEATURES

Taking into consider scientifically proved great therapeutic possibilities of Banja Koviljača's sulphuric peloid, it has been applied in the treatment of different diseases of locomotive system in children, and empirical knowledge and experience have also been used.

Banja Koviljača's peloid is:

- mineral peloid whose inorganic components are clay, lime, quartz, silicate minerals, marl, and salts coming from mineral water which impregnates peloid.

- this mud is not homogeneous mass, but it consists of solid and water particles mutually tied by appropriate physical processes.

- it is sandy alverit by its content (80.4% of fraction with particle-size distribution rate of 0.05-0.005mm).

- it has high thermal capacity which depends on the size of particles.

- chemical effect, attributed to sulphur activity, and by pH value it belongs to Weak alkali peloids, is therapeutically favorable because it makes skin soft, smooth and elastic.

- heat from peloid causes skin swelling and pores opening which enables passing ingredients of peloid solution.

Granulometric report of sample No 1 grain size (wet mud)

It can be seen from the table that most grains size ranges from 0.05 to 0.005mm (80.4%).

Fraction mm	%	Cumulative %
2.000	0.80	0.80
1.000	2.20	3.00
0.500	2.50	5.50
0.250	5.10	10.60
0.125	3.00	13.60
0.050	5.00	18.60
0.025	28.40	47.00
0.005	52.00	99.00
0.004	1.00	100.00
Total	100.00%	

PELOID EFFECT IS BASED ON:

- long-lasting vasodilatation, metabolism support and revascularization

- improved local blood and lymph circulation

- accelerated resorption of pathology products and edema

- improved trophic

- accelerating regenerative processes

- analgesic effect

- relaxing tensed musculature and tendon system

- enhancing elasticity of spastic musculature – spasmolytic effect

- osteogenic (accelerated callus formation) and chondrogenic (cartilage repair) effect.

PELOID PREPARATION

In Banja Koviljača, peloid is made of clay found in this area, by grinding and placing into open pools with partitions over which sulphuric water constantly runs in a 3 year's period in order to be "ripe".

Soaked clay is often mixed and ground to absorb sulphur and other substances well and to get special gray and dark color in that way.

THE DARKER COLOR THE BETTER QUALITY OF PELOID

During ripening, the basic action principle in sulphur based peloid increases up to 60%.

After “ripening” it is transported in mud baths, placed into kettles where it is ground to extremely tiny particles and heated up by steam up to 65°C.

Agglomeration of particles and binding larger amounts of water occurs by this way of heating, which changes thermal capacity and thermal conductivity of peloid.



Fig.1. Mud cannals



Fig.2. Peloid prepared for application

Banja Koviljača's peloid has good plasticity, viscosity and adhesion. It adheres to skin well, it is not easy for rinsing, it has fat consistency and fine gradation.

Used peloid is never used again for its physical-chemical and microbiological properties are changing and sanitary condition becomes worse.

Peloid regeneration is not practiced in Banja Koviljača or it is but extremely rarely.

If regeneration is processed, it is done in special pools where 40 cm of mineral water lies over peloid. This process lasts from 6 months to one year.

Peloids used in skin and gynecological diseases do not enter the process of regeneration.

Peloid regeneration is done only once.

PELOID PREPARATION METHODS

In CHILDREN, peloid is applied exclusively locally, directly on the skin (as moistured heat), with 3-5cm layer on joints, osteotomy or fracture areas, on particular segments and joints with contracture. The plastic foil and cotton cloth are placed over peloid layer.

Peloid temperature for children is 38 to 40 degrees. Application lasts for 20 minutes, then peloid is removed by rinsing, and after all that comes rest and kinesiotherapy.

Maximum number of serial applications is 20, then comes 2 weeks' break time, and after that a serial starts again.

In cases of resistant contractures, regardless to etiology, we have used KINESIOTHERAPY IN PELOID (shoulder, elbow, knee, ankle). First, peloid is applied on a joint, and 10



Fig.3. Kettle for heating up peloid

minutes after that, exercising starts in order to improve motion range.

Kinesiotherapy in peloid was also applied for peripheral nerve lesions in arms and legs, i.e. hands and feet where active movements existed – a child should “knead” mud with its hand, and to make dorsal and plantar flexion movements with its foot

INDICATIONS FOR SULPHURIC PELOID APPLICATION ARE:

- anomalies and deformities of locomotive system, before and after the operation:

- pes equinovarus
- pes equinovalgus
- pes metatarsus varus
- pes talovalgus
- arthrogriposis
- limb hypoplasia and aplasia
- other bone-joint deviations

- aseptic joint necrosis:

- M. Perthes, M. Schlater,
- epiphysiolysis
- developmental hip disorders – after operation



Fig. 4. Local peloid application



Fig. 5. Plastic foil placed over peloid



Fig. 6. and Fig. 7. Kinesiotherapy in peloid – passively, in resistant contractures



Figs. 8. and 9. Kinesiotherapy in peloid - actively

- innate limb abbreviations managed by distraction according to Ilizarov
- locomotive system fractures at all levels – polytraumas
- spastic forms of cerebral palsy before and after the operation
- pseudoarthrosis
- Sudeck’s dystrophy in chronic phase
- Volkmann’s contracture in sub acute phase
- osteogenesis imperfecta
- slight lesions of central nervous system

- hemipareses, parapareses, quadripareses
- severe lesions of central nervous system, spastic forms
- PRESENCE OF METAL IN A TISSUE IS NOT CONTRAINDICATION FOR PELOID APPLICATION DUE TO LOW HEAT CONDUCTIVITY!!!
- rheumatic diseases during remission
- joint contractures, except in case of inflammation of joints
- peripheral nerve lesions in subacute and chronic phase

In peripheral nerve lesions peloid is applied as a pretreatment for electrostimulation of nerves due to its known effects.

CONTRAINDICATIONS FOR PELOID APPLICATION IN CHILDREN ARE:

- children who are less than one year old

- fractures in children up to three years old, due to large exocalus creation (most often femur, humerus, tibia)

Neuromuscular diseases:

- dystrophy
- myotonia
- spinal muscle atrophy
- muscles hypotonia
- polyradiculoneuritis
- all kinds of malignant diseases
- feverish conditions
- rheumatic diseases in during exacerbation
- coagulation disorders
- thyroid gland diseases
- pronounced heat perception disorders
- all forms of tuberculosis
- hemangiomas and varicosities
- severe cases of anemia

- heart failure
- bleeding
- epilepsy, but if it is subjected to the medical treatment, segment application of peloid is allowed
- M. exostoticum

SIDE-EFFECTS

In previous times, before modernizing peloid application (chopping, grinding and making homogeneous) slight burns on the skin used to occur at places where small pebbles or other sharp ingredient touched the skin.

In such cases, peloid application was terminated until burns signs withdrew.

Nowadays, possible side-effects are avoided by properly determining indications for peloidotherapy, by following regulated contraindication, by modern preparation and adequate technique for peloid application.

In children, extremely rarely, macular rash on skin without any symptoms may occur, and it withdraws in 2-3 days without medical treatments or stopping peloid application.

Children usually protest about oddour smell of sulphur, which imbeds peloid.

Sulphuric peloid does not have side-effects.

Apstrakt

U tretmanu različitih oboljenja lokomotornog aparata kod dece primenjuje se sumporoviti peloid Banje Koviljače, zbog njegovih velikih terapijskih mogućnosti dokazanih naučno a korišćena su i empirijska znanja.

CILJ rada je da se prikaže terapijski efekat sumporovitog peloida B. Koviljače u lečenju oboljenja i povreda lokomotornog aparata kod dece.

Specifičnost sumporovitog peloida B. Koviljače je u velikom toplotnom kapacitetu, koji zavisi od veličine čestica, maloj toplotnoj provodljivosti i hemijskom dejstvu koje se pripisuje sumporu.

Peloid se primenjuje posle »sazreivanja« direktno na kožu, u lokalnoj aplikaciji na T-38-40.stepeni u sloju od 4cm. u trajanju od 20.min. a potom se sprovodi kineziterapija.

Sprovodi se i KINEZITERAPIJA U PELOIDU, koja daje izvanredne rezultate.

Indikacije za primenu peloida kod dece su: anomalije i deformiteti lokomotornog aparata,koštano-zglobne devijacije,aseptične nekroze, epifiziolize(pre i postoperativno), razvojni poremećaji kukova, politraume, lezije perifernih nerava,reumatska oboljenja u fazi remisije, lakši oblici cerebralne paralize itd.

Kontraindikacije za primenu sumor.peloida kod dece su: uzrast dece ispod 3g. ,neuromišićna oboljenja i distrofije, maligna oboljenja, febrilna stanja, reumatska oboljenja u fazi egzacerbacije,poremećaj faktora koagulacije, oboljenja štitaste žlezde itd.

Sumporoviti peloid Banje Koviljače daje odlične rezultate u lečenju nekih oboljenja i povreda lokomotornog aparata kod dece.

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