



Krioterapija Cryotherapy

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Apstrakt

Krioterapija podrazumeva kontrolisano smrzavanje tkiva radi destrukcije njegovih pojedinih delova. Za izvođenje se koriste lako isparljive tečnosti.

Tečni azot se čuva u specijalnim posudama, kontejner bocama, iz kojih se sipa u sprej boce-brajmil i termos flaše iz kojih azot koristimo za terapiju. Relativno je jednostavna metoda, prilagođena za ambulantnu terapiju. Tehnika zamrzavanja se može obavljati pomoću drvenog štapića na koji se namota komadić vate umočen u tečni azot koji se nalazi u termos flaši i koji potom nanosimo na određenu leziju. Na sprej bocu možemo staviti određeni nastavak koji se koristi, u zavisnosti od veličine i lokalizacije promene koja se treba tretirati. Temperature od -25 i -50 se mogu postići, ukoliko se dovoljna količina tečnog azota u spreju ili štapiću aplikuje u roku od 30 sekundi. Tehnika zamrzavanja se obavlja sa daljine 1 – 1,5 cm od površine kože.

Indikacije za primenu krioterapije:

1. Infekcije humanim papiloma virusima (HPV infekcije)
 - a) *Verrucae vulgaris* – infektivne bradavičaste promene na koži koje se lokalizuju na dorzumima šaka i podlakticama.
 - b) *Verrucae planae juveniles* – zaravnjene bradavice boje normalne kože koje se lokalizuju na licu i dorzalnim stranama šaka.
 - v) *Verrucae plantares* – neravne bradavice lokalizovane na tabanima, okružene hiperkeratotičnim rubom. Na njihovoj površini uočavaju se crne tačkice, takozvani trombozirani kapilari.
 - g) *Condylomata acuminata* – kondilomi ili polne bradavice. Javljaju se u anogenitalnoj regiji ili u vidu vlažnih karfiolastih vegetacija. Izazvane su hpv infekcijom tip 6, 11, 16, 18, 31, 32, 33, 35. Svi tipovi virusa, osim 6 i 11, onkogeni su i mogu indikovati genitalnu displaziju koja prelazi u spinocelularni karcinom.
 - d) *Molluscum contagiosum* – virusna infekcija, karakteristična po pojavi kupolaste papule boje normalne kože i umbilikovanog centra koji dolazi do izražaja prilikom krioterapije.

Najčešći vid komplikacije krioterapije jeste pojava promrzlina koje su različitog inteziteta. Zamrzavanje lezija u čeonom podelu može da dovede do glavobolja, a u predelu kapičijuma do alopecije (gubitka kose). Hiperpigmentacije i hipopigmentacije su česte, posebno kada se koriste tehnike produženog zamrzavanja.

Abstract

Cryotherapy involves the controlled freezing of tissue to destroy its parts. Easily volatile liquids are used for execution.

Liquid nitrogen is stored in special containers, container bottles, from which it is poured into spray bottles and thermos bottles, from which we use nitrogen for therapy. It is a relatively simple method, adapted for outpatient therapy. The freezing technique can be performed using a wooden stick on which a piece of cotton dipped in liquid nitrogen in a thermos bottle is wound and which is then applied to a specific lesion. We can put a certain extension on the spray bottle that is used, depending on the size and localization of the change to be treated. Temperatures of -25 and -50 can be achieved if a sufficient amount of liquid nitrogen in a spray or stick is applied within 30 seconds. The freezing technique is performed from a distance of 1-1.5 cm from the surface of the skin.

Indications for the use of cryotherapy:

1. Human papilloma virus infections (HPV infections)
 - a) *Verrucae vulgaris* – infectious warty changes on the skin that are localized on the backs of the hands and forearms.
 - b) *Verrucae planae juveniles* – flattened warts of normal skin color that are localized on the face and dorsal sides of the hands.
 - v) *Verrucae plantares* – uneven warts localized on the soles of the feet, surrounded by a hyperkeratotic edge. Black dots, so-called thrombosed capillaries, can be seen on their surface.
 - g) *Condylomata acuminata* – condylomas or genital warts. They appear in the anogenital region or the form of wet cauliflower-like vegetation. They are caused by HPV infection types 6, 11, 16, 18, 31, 32, 33, 35. All types of viruses, except 6 and 11, are oncogenic and may indicate genital dysplasia progressing to squamous cell carcinoma.
 - d) *Molluscum contagiosum* – a viral infection, characterized by the appearance of a domed papule the color of normal skin and an umbilical center that comes to the fore during cryotherapy.

The most common type of complication of cryotherapy is the appearance of frostbite, which is of varying intensity. Freezing lesions in the frontal division can lead to headaches, and in the area of the capillium to alopecia (hair loss). Hyperpigmentation and hypopigmentation are common, especially when extended freezing techniques are used.