

# ENTERALNA PREHRANA NEKAD I SAD

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**Pešić, Mladen; Krznarić, Željko**

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TEMATSKI BROJ

## Enteralna prehrana

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*Gosti urednici: Mladen Peršić i Željko Krznarić*

### ENTERALNA PREHRANA NEKAD I SAD

Pravilna prehrana temeljni je uvjet opstanka živog bića, tj. preduvjet održanja energetskih i metaboličnih homeostatskih procesa. U suvremenoj ljudskoj zajednici uzimanje hrane nije samo ispunjavanje fiziološke potrebe nego postaje obilježjem kulture i statusa, zrcalom životne filozofije i religijskih nazora. Istodobno, značajan je rast interesa i brige za održanje zdravlja i potrebe da se dijetnim modifikacijama produlji životni vijek, spriječe ili izliječe kronične bolesti, osigura dugovječnost i zdrava starost.

Spoznaje o značenju prehrane u liječenju bolesnika prisutne su odavno i sastavni su dio svih medicinskih kultura i škola, uključivši našu sadašnju.

Pojam "klinička prehrana" obuhvaća sve oblike prehrane bolesnika, tj. uobičajenu peroralnu prehranu, dijetne modifikacije i pripravke te enteralnu i parenteralnu prehranu.

Osnovni koncept nutritivne potpore bolesnicima datira još iz vremena ranih civilizacija Egipta, Grčke i Rima, kada se postavljaju i temelji enteralne prehrane.

Enteralna prehrana važan je segment kliničke prehrane, a osnovni je preduvjet njezine primjene strukturalno i funkcionalno podoban probavni sustav, osobito tanko i debelo crijevo. U ovom obliku nutritivne podrške hrana i/ili komercijalne nutritivne otopine i pripravci, unose se različitim hranidbenim sondama u želudac, dvanaesnik ili jejunum.

Nutritivna potpora enteralnim putem u zadnja dva desetljeća doživljava upravo neviđen uzlet. Značajan napredak u razvoju posebnih enteralnih formula te različitih akcesorija (sonde, pumpe) doveo je do toga da je enteralna prehrana postala najprihvatljiviji i ekonomski najpovoljniji način nutritivne potpore u bolničkim i kućnim uvjetima liječenja.

Različiti oblici enteralnih pripravaka razvijaju se unatrag više stotina, ako ne i tisuća godina. Medicinski zapi-

si iz razdoblja Starog Egipta, 3000 godina prije Krista, opisuju primjenu nutritivnih klizmi (mješavina vina, mlijeka, surutke, pšenice, bujona) kao alternativnog načina hranjenja bolesnika i liječenja proljeva.

Zanimljivost je da modificirani koncept nutritivnih klizmi primjenom krantolančanih masnih kiselina (butiratne ili maslačne) u liječenju ulceroznog kolitisa predstavlja danas gotovo vrhunac razvoja nutritivne potpore i održanja integriteta sluznice debelog crijeva. Capivaccus (1598.), Aquapendente (1617.), Von Helmont (1646.) i Boerhave (1710.) svojim idejama otvaraju put razvoju nazogastričnog načina hranjenja primjenom primitivnih oblika sondi. John Hunter, rodonačelnik britanske kirurgije, opisuje 1790. godine, na način primjeren suvremenome medicinskom razmišljanju, primjenu nutritivne sonde za dopremanje hrane u želudac. Ta je sonda bila načinjena od jeguljine kože i kitove kosti. Sljedeći značajni koraci u razvoju enteralne prehrane zbili su se 1910. godine, kada je Max Einhorn opisao prvu primjenu duodenalne sonde, te 1958. godine, kada Barron i Fallis razvijaju prvu enteralnu pumpu i načine kontinuirane primjene enteralnih pripravaka.

Enteralne formule razvijaju se neprekidno od sredine dvadesetog stoljeća, a prekretnica je Rosov prototip elementarnog enteralnog pripravka koji se pojavio 1949. godine. Ruski astronaut German Titov (kolovoz, 1961.) i američki John Glenn (veljača, 1962.) prvi su ljudi koji su se hranili u svemiru, ali su i prvi ljudi koji su se suočili sa situacijama mikrogravitacije i hipogravitacije, te posljedica djelovanja na hranjenje. Osobitu važnost za razvoj enteralnih pripravaka ima NASA-in program svemirskih letova s ljudskom posadom i potreba za razvojem enteralnih pripravaka pogodnih za hranjenje astronauta, s naglaskom na smanjenju količine stolice. Iz tog je razdoblja tipičan prikaz Greensteina i Winitza koji

se ubraja u klasike nutricionističke literature, a objavljen u časopisu *Nature* 1965 godine.

Od tihog ulaska enteralnih formula u kliničku medicinu prije pedeset godina, do danas je učinjen značajan napredak. Sredinom prošlog stoljeća imali smo ograničene spoznaje o značenju hranjenja bolesnika koji nisu mogli uzimati normalnu hranu, o komplikacijama enteralne, ali i parenteralne nutritivne potpore, a razvoj enteralnih otopina bio je tek u začetku.

Klinička prehrana danas, osobito enteralna prehrana, spada u sam vrh medicinske misli i djelovanja. Rastu spoznaje o interakciji hrane i gena, a različiti nutritivni sastojci svojim farmakološkim djelovanjima afirmiraju imunonutriciju kao sasvim nov koncept u razvoju ovog segmenta liječenja.

Na europskom tržištu trenutačno je prisutno više od 150 različitih enteralnih pripravaka, a na listi Hrvatskog zavoda za zdravstveno osiguranje nalazi se 19 enteralnih pripravaka. To omogućuje različite oblike nutritivne podrške bolesnika ne samo u institucijama, već i u kućnom liječenju, što je iskorak gotovo istovjetan razvoju najsofisticiranijih formula ili sustava za aplikaciju.

Enteralna prehrana, kao temelj, te eventualna njezina nadopuna parenteralnim pripravcima do zadovoljenja potpunih nutritivnih potreba, vrh su nutritivne piramide.

*Mladen Peršić*

KBC Rijeka  
Klinika za pedijatriju  
"Kantrida"

*Željko Krznarić*

KBC Zagreb-Rebro  
Interna Klinika  
Zavod za gastroenterologiju

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## USPOREDBA ENTERALNE I PARENTERALNE PREHRANE

### COMPARISON BETWEEN ENTERAL AND PARENTERAL NUTRITION

Željko Krznarić<sup>1</sup>, Živka Dika<sup>2</sup>

#### SAŽETAK

Enteralna i parenteralna prehrana osnovni su oblici nutritivne podrške u kliničkoj medicini. Ciljevi primjene enteralne i parenteralne prehrane jesu prevencija ili korekcija nutritivnih deficita i sindroma malnutricije. Dobro poznavanje tih oblika kliničke prehrane omogućava valjan i pravodoban terapijski pristup. Enteralna prehrana ima brojne prednosti naspram parenteralne prehrane u bolesnika s očuvanom strukturom i funkcijom probavnog sustava. Parenteralna prehrana je način supstitucije organizma vodom, energetskim supstratima, kao i svim drugim hranjivim tvarima krvožilnim putem u bolesnika s kontraindikacijama za primjenu enteralne prehrane ili u situacijama kada se primjenom enteralne prehrane ne mogu u potpunosti zadovoljiti sve nutritivne potrebe.

**KLJUČNE RIJEČI:** enteralna prehrana, parenteralna prehrana, indikacije, provođenje, komplikacije

Klinička prehrana obuhvaća sve oblike prehrane bolesnika, tj. uobičajenu peroralnu prehranu, dijetne modifikacije i pripravke te enteralnu i parenteralnu prehranu.

*U užem smislu klinička prehrana obuhvaća enteralnu i parenteralnu prehranu.*

Nakon procjene stanja uhranjenosti te uvida u stanje i funkciju probavnog sustava (osobito tankog i debelog crijeva), odlučujemo o obliku kliničke prehrane koji se može i koji je poželjno provoditi tijekom liječenja (tablica 1.).

#### ABSTRACT

Enteral and parenteral nutrition are the main methods of nutritional support in clinical medicine. Enteral and parenteral nutrition are administered in order to prevent or correct nutritional deficits and malnutrition syndroms. A good knowledge of these methods of clinical nutrition ensures a proper and timely therapeutic approach. Enteral nutrition has numerous advantages in comparison with parenteral nutrition in patients with the preserved structure and function of the digestive system. Parenteral nutrition is a way of substituting the organism with water, energetic substrates and all other nutrients using the intravenous route in patients with counterindications for enteral feeding or in situations in which the administration of enteral feeding cannot meet all nutritional needs.

**KEY WORDS:** enteral feeding, parenteral feeding, indications, administration, complications

#### UOBIČAJENA PERORALNA PREHRANA I DIJETNE MODIFIKACIJE

Razvoj znanosti o prehrani u prošlom stoljeću kretao se od uočavanja i prepoznavanja problema nutritivnih deficita, njihove prevencije i rješavanja do razvoja modela uranotežene prehrane, s ciljem promicanja zdravlja i smanjenja rizika za nastanak pojedinih bolesti. Na prijelazu u novi milenij razvija se model optimalne prehrane koja pojačavanjem fizioloških funkcija osigurava stanje maksimalnog zdravlja. Radi se o konceptu poznatijem kao *funkcionalna hrana*. Peroralna prehrana koja se razvijala na temeljnim postulatima nutricionizma, najbolji je način nutritivne podrške i treba je uvijek provoditi ako je bolesnik sposoban uzimati hranu.

Ovaj način prehrane uključuje standardnu dijetu i različite dijetne prilagođene pojedinim kliničkim zahtjevima. Modificirane ili prilagođene dijetne razlikuju se ili u konzistenciji ili sadržajem nutritivnih pripravaka.

Ustanova: <sup>1</sup>KBC i Medicinski fakultet – Zagreb, <sup>2</sup>Medicinski fakultet – Zagreb

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Adresa za dopisivanje: Doc. dr. sc. Željko Krznarić, KBC Zagreb, Klinika za unutarnje bolesti, Kišpatićeva 12, 10000 Zagreb