



# LISA metoda za primenu surfaktanta kod novorođenčadi

## LISA Method for Application of Surfactant in Newborn Children

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### Apstrakt

Oslabljena funkcija pluća novorođenčadi je akutno, primarno oboljenje pluća novorođenčeta, nastalo kao posledica nedostatka surfaktanta. Respiratorni distress sindrom (RDS) je najčešće oboljenje koje dovodi do poremećaja disanja novorođene dece, naročito prevremeno rođene dece. Primarni nedostatak surfaktanta nastaje zbog poremećene sinteze, sinteze lošeg kvaliteta, pojačane razgradnje i apsorpcije, oslobađanja alveolarne tečnosti i disfunkcije endotela. Surfactant procentualno najvećim delom čine fosfolipidi. Surfactant ima zadatak da smanji površinsku napetost i održi stabilnost alveola. Razvoj pluća se deli u tri stadijuma (glandularni, kanalikularni, alveolarni). Da bi pluća preuzela svoju ulogu, u kratkom vremenu se moraju desiti promene. Alveolarna tečnost, koja ispunjava pluća do časa rađanja, mora biti odstranjena. Plućne alveole se moraju trajno ispuniti vazduhom, koji delom ostaje i na kraju ekspirijuma. Protok krvi kroz pluća se mora povećati šest do deset puta. Centar za disanje mora preuzeti svoju funkciju. Kod prevremeno rođene dece, kod koje nema dovoljno surfaktanta na kraju svakog izdisaja, veliki broj alveola ostaje kolabiran, tj. slepljen, pa prilikom sledećeg udisaja treba upotrebiti veliki pritisak kako bi se ponovo ispunile vazduhom. Predisponirajući faktori za nastanak RDS: prematuritet, asfiksija, hipotermija, muški pol, dete majke obolele od dijabetesa, familijarna predispozicija. Nedostatak surfaktanta dovodi do smanjenja disajnog volumena, smanjenja plućne komplijanse, poremećaja ventilaciono perfuzionog odnosa, povećanja plućne vaskularne rezistencije, povećanja disajnog rada. Klinička slika se ispoljava neposredno posle rođenja ili u prvih 4–6 sati po rođenju. Klinički simptomi definišu se trijasom (tahipneja, cijanoza, dispneja). Dijagnoza se postavlja na osnovu anamnestičkih podataka o trudnoći i porođaju majke, kliničke slike, RTG pluća, gasnih analiza. Cilj terapije kod oslabljene funkcije pluća (RDS) je da se novorođenče održi u dobrom kliničkom stanju do početka sinteze sopstvenog surfaktanta. Inicijalni transport podrazumeva adekvatnu reanimaciju i transport u JINN. Trudnice koje su u visokom riziku od prevremenog porođaja treba da budu prebačene u perinatalne centre koji imaju iskustvo u terapiji RDS. Terapija surfaktantom ima važnu ulogu u lečenju RDS. Preparati životinjskog porekla odobreni u Evropi su: alveofakt, cufosurf. Surfactant se daje intratrahealno. Komplikacije RDS mogu biti rane i kasne. Rane komplikacije su respiratorne, kardiovaskularne neurološke, gastrointestinalne. Kasne komplikacije su BPD.

### Abstract

Weakened lung function of newborns is an acute, primary disease of the lungs of newborns, caused as a result of lack of surfactant. Respiratory distress syndrome (RDS) is the most common disease that causes breathing disorders in newborns, especially premature babies. Primary surfactant deficiency is due to impaired synthesis, poor quality synthesis, enhanced breakdown and absorption, release of alveolar fluid, and endothelial dysfunction. The percentage of surfactant is mostly made up of phospholipids. Surfactant has the task of reducing the surface tension and maintaining the stability of the alveoli. Lung development is divided into three stages (glandular, canalicular, and alveolar). For the lungs to assume their role, changes must occur in a short time.

The alveolar fluid, which fills the lungs until the time of birth, must be removed. The lung alveoli must be permanently filled with air, which partially remains at the end of expiration. Blood flow through the lungs must increase six to ten times. The respiratory center must assume its function. In premature children, who do not have enough surfactant at the end of each exhalation, a large number of alveoli remain collapsed, i.e. stuck, so during the next inhalation, great pressure should be used to fill them with air again. Predisposing factors for the occurrence of RDS: prematurity, asphyxia, hypothermia, male gender, child of a diabetic mother, and family predisposition. The lack of surfactant leads to a decrease in respiratory volume, a decrease in lung compliance, a disturbance in the ventilation-perfusion ratio, an increase in pulmonary vascular resistance, and an increase in the work of breathing.

The clinical picture appears immediately after birth or in the first 4–6 hours after birth. Clinical symptoms are defined by a triad (tachypnea, cyanosis, dyspnea). The diagnosis is made based on anamnestic data on the mother's pregnancy and childbirth, clinical picture, X-ray of the lungs, and gas analysis. The goal of therapy in impaired lung function (RDS) is to maintain the newborn in a good clinical condition until the synthesis of its surfactant begins. Initial transport involves adequate resuscitation and transport to the NICU. Pregnant women who are at high risk of preterm birth should be transferred to perinatal centers that have experience in RDS therapy. Surfactant therapy has an important role in the treatment of RDS. Preparations of animal origin approved in Europe are alveofact, cufosurf. Surfactant is given intratracheally. Complications of RDS can be early or late. Early complications are respiratory, cardiovascular, neurological, and gastrointestinal. Late complications are BPD.