

ARDS : early diagnosis & prevention of irreversible change by surfactant therapy

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1997 Fiscal Year Final Research Report Summary

ARDS : early diagnosis & prevention of irreversible change by surfactant therapy

Research Project

Project/Area Number

07457353

Research Category

Grant-in-Aid for Scientific Research (B)

Allocation Type

Single-year Grants

Section

一般

Research Field

Anesthesiology/Resuscitation studies

Research Institution

Kanazawa University

Principal Investigator

KOBAYASHI Tsutomu Kanazawa Univ.School of Med.Professor, 医学部, 教授 (40019922)

Co-Investigator(Kenkyū-buntansha)

MATSUMOTO Yutaka Kanazawa Univ.Hospital Instructor, 医学部・附属病院, 助手 (90262584)

TASHIRO Katsumi Kanazawa Univ.Hospital Instructor, 医学部・附属病院, 助手 (30242556)

Project Period (FY)

1995 - 1997

Keywords

ARDS / surfactant protein / replacement therapy / endotoxin / elastase / surface tension / vascular resistance / rat

Research Abstract

- (1) Determination of the reversible period in adult (acute) respiratory distress syndrome (ARDS) : In experiment to administrate endotoxin, elastase, lysolecithin, and anti-surfactant protein B monoclonal antibody in rats and rabbits, the ARDS-like symptom could be reversed by surfactant replacement until 6 hours after the arterial oxygen pressure (PaO₂) started to decrease. Therefore, 6 hours after the onset of the symptom was thought to be the reversible period. Formation of hyaline membrane, however, was noted in the alveoli even at the reversible period, suggesting that some cares should be taken to prevent the organic changes as early as possible.
- (2) Replacement method of surfactant and development of artificial surfactant : In rats, inhalation of an aerosolized surfactant (modified natural surfactant, Surfactant CK) reversed symptoms of ARDS-like lung injury which was induced by administration of endotoxin. By this procedure, the organic change of the lung tissue, an irreversible damage, could be postponed at least for 6 hours. In addition, an artificial surfactant which was prepared with synthetic dipalmitoyl-phosphatidylcholine, phosphatidylglycerol and dioleoylphosphatidylcholine (60 : 20 : 20) plus surfactant protein B (0.7%) and C (1.4%) exhibited the same effects with Surfactant CK.
- (3) Relation between condition of pulmonary surfactant and vascular resistance : We found that inactivation of pulmonary surfactant induces dilatation of the capillary vessels of the alveoli. We think that this is an important finding to explain the mechanism of hypoxemia in ARDS.
- (4) Early diagnosis of ARDS : We have obtained some findings that surface tension values of the liquid aspirated from the trachea may be useful for early diagnosis of ARDS.

Research Products (49 results)

All Other

All Publications (49 results)

- [Publications] Tashiro, Katsumi: "Surfactant replacement reverses respiratory failure induced by intratracheal endotoxin in rats." Critical Care Medicine. 23. 149-156 (1995) ▼
- [Publications] Kita, Yoshito: "Status asthmatics complicated by atelectasis in a child." American Journal of Emergency Medicine. 13. 164-167 (1995) ▼
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- [Publications] Tashiro, Katsumi: "Surfactant replacement therapy for acute lung injury caused by inhalation of aerosolized water-repellent in rats." Applied Cardiopulmonary Pathophysiology. 5. 119-120 (1995) ▼
- [Publications] 山田, 圭輔: "エンドトキシンにより呼吸不全を呈したラットに対するサーファクタント吸入療法" 金沢大学十全医学会雑誌. 104. 26-35 (1995) ▼
- [Publications] 早稲田, 祐子: "換気量増加に必要なサーファクタント関連蛋白の種類および量" 金沢大学十全医学会雑誌. 104. 311-321 (1995) ▼
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- [Publications] 長瀬, 典子: "エラストーゼの気管内投与により急性呼吸不全を呈したラットに対する肺サーファクタント補充療法" 日本界面医学会誌. 27. 74-79 (1996) ▼
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