

Pneumonia Caused By Sewage Aspiration

S Sah?n, D Memis, M Tasdogan, B Eksert, A Soker

Citation

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Abstract

Aspiration is defined as entry of a foreign substance, solid or liquid, into the respiratory tract or inhalation of fumes and vapors. Aspiration pneumonia is caused by a direct chemical insult due to the aspirated material or by a primary or secondary bacterial infection. A three-year-old, 15 kg male patient fell into sewage accidentally and was brought to our hospital. His body was all covered with sewage. Sewage was aspirated and tracheal intubation was performed. 250 ml of fluid was aspirated at nasogastric and intubation tube. Respiratory and cardiopulmonary support and antibiotics were immediately started. After 15 days, he was sent to service with stable vital signs.

This is a report on a pediatric patient ICU therapy for aspiration pneumonia.

INTRODUCTION

Aspiration is defined as the inhalation of oropharyngeal or gastric contents into the larynx and lower respiratory tract (1,2). Several pulmonary syndromes may occur after aspiration, depending on the amount and nature of the aspirated material, the frequency of aspiration, and the host's response to the aspirated material (2,3). Damage to the airways and lung parenchyma from aspiration is a common clinical problem with diagnostic and therapeutic challenges. The insult may be acute or chronic. The amount of concentration, chemical composition, and size of particles vary, and the lesion produced may be reversible or irreversible. Death may be immediate or late. Recovery may be complete, or crippling pulmonary disease may follow (4). In this review, it is reported on the aspiration of sewage fluid into the respiratory tract.

CASE REPORT

A three-year-old, 15 kg male patient who fell into sewage accidentally was brought to our hospital. His body was all covered with sewage. He was unconscious with a Glasgow Coma Scale (GCS) of 5. The pupils remained constricted throughout his physical examination and no anisocoria was noted. Sewage was aspirated and tracheal intubation was performed. 250 ml. of fluid was aspirated at nasogastric and endotracheal tube. He was transferred to the intensive care unit. Arterial blood pressure was 130/60 mmHg, fever (37.3C), with a heart rate of 135 beats/min. Leukocyte count 13.21 mm³, hemoglobin 12.7 g/dl, haematocrit 37.5 %, platelet 272.000 mm³, electrolytes were normal. The patient

did not take any medications, and had an unremarkable medical record. Thoracic Computer tomography revealed bilateral pulmonary air bronchograms and common area of consolidation. Cervical tomography was normal and cranial computerized tomography revealed bilateral cerebral edema and neuronal changes in cerebral hypoxia- ischemia. Blood gas analysis was found as pH: 7.15 pCO₂:25mmHg, pO₂:55mmHg, HCO₃:8.7mmol/L, sPO₂: 84. Sedation was achieved using midazolam and performed mechanically ventilated in pressure-controlled mode (fiO₂:%60, frekans:30/min.,PEEP:6 cmH₂O, tidal volume 6 ml/kg). Cardiopulmonary support and antibiotic therapy were immediately started. Because of bilateral cerebral edema, supportive treatment included steroid therapy. Following the treatment 15 days later, the patient's condition improved and he was discharged to service with stable vital signs.

DISCUSSION

Aspiration pneumonia is caused by inhaling foreign material (usually food, liquids, vomit, or secretions from the mouth) into the lungs. This may lead to an inflammatory reaction, a lung infection or a collection of pus in the lungs. This disease occurs in people with altered levels of consciousness resulting from seizures, cerebrovascular accident, central nervous system mass lesions, drug intoxication or overdose, and head trauma. The risk of aspiration is indirectly related to the level of consciousness of the patient (ie, decreasing Glasgow Coma Scale is related with increased risk of aspiration). The extent and severity of this disease is directly related to the volume and acidity of the fluid aspirated (1,2,3).

Aspiration pneumonia in our patient was occurred of fall accident into sewage. He was unconscious. The optimum management is symptomatic and should entail immediate endotracheal suction, aggressive ventilatory support with supplemental oxygen, Continuous Positive Airway Pressure (CPAP) or positive end-expiratory pressure (PEEP) if indicated by clinical assessment and blood gas measurements, adequate fluid replacement and antibiotics if there is evidence of bacterial infection (5). We were performed tracheal intubation, endotracheal suction and mechanically ventilated in pressure-controlled mode (fiO2:%60, frequency:30/min., PEEP:6 cmH2O, tidal volume 6 ml/kg). Cardiopulmonary support and antibiotic therapy were immediately started.

Tyler et al. investigated the effects of meconium on the lungs of an adult rabbit model to distinguish mechanical obstruction of airways from chemical pneumonitis. After the rabbits were anesthetized and intubated, 20% human meconium in saline was instilled into the trachea. The results were consistent with an early mechanical obstruction of airways with gradual development of chemical pneumonitis over 48 hours (6). Our patient was development aspiration pneumonia over 48 hours.

Antibiotic therapy is unequivocally indicated in patients with aspiration pneumonia. The choice of antibiotics should depend on the setting in which the aspiration occurs as well as the patient's general health. The use of antibiotics shortly after aspiration in patients in whom a fever, leukocytosis, or a pulmonary infiltrate develops is discouraged, since the antibiotics may select for more resistant organisms in patients with an uncomplicated chemical pneumonitis. However, antibiotic agents with activity against gram-negative organisms, such as third-generation cephalosporins, fluoroquinolones, and piperacillin are usually required. Penicillin and clindamycin, which are often called the standard antibiotic agents for aspiration pneumonia, are inadequate for most patients with aspiration pneumonia. (7) Antibiotic agents with specific anaerobic activity are not routinely warranted and may be indicated only in patients with putrid sputum, or evidence of necrotizing pneumonia or lung abscess on radiographs of the chest (3,7,8). Since sewage fluid was aspirated, antibiotics were started.

Sukumaran and colleagues found that radiographically evident lung injury improved more quickly in the patients

given corticosteroids than in those given placebo; however, the patients given corticosteroids had a longer stay in the intensive care unit, and there were no significant differences between the two groups in the incidence of complications or the outcome (9,10). Steroid therapy was used as a result of bilateral cerebral edema.

In conclusion, aspiration pneumonia is a relatively uncommon clinical entity in children. However, it does cause significant morbidity and mortality. Severe aspiration pneumonia requires treatment in an ICU. The trachea may need suctioning to clear secretions and aspirated particles out of the airway. Antibiotic treatment should be started with respect to bacterial pathogens.

CORRESPONDENCE TO

Anaesth Dr Sevtap Hekimoglu Sahin Trakya University Medical Faculty, Department of Anaesthesiology and Reanimation, 22030, Edirne, TURKEY Tel No : 0 90 284 2357641/3200 Fax No: 0 90 284 2358096 E-mail. sevtaphekimoglu@mynet.com

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Author Information

S. H. Sah?n, M.D.

Anaesth Dr., Department of Anesthesiology, Trakya Univ. Medical Faculty

D. Memis, M.D.

Assoc. Prof. Dr., Department of Anesthesiology, Trakya Univ. Medical Faculty

M. Tasdogan, M.D.

Asisst Dr., Department of Anesthesiology, Trakya Univ. Medical Faculty

B. Eksert, M.D.

Asisst Dr., Department of Anesthesiology, Trakya Univ. Medical Faculty

A. Soker, M.D.

Asisst Dr., Department of Anesthesiology, Trakya Univ. Medical Faculty