FILE NAME: Johnson & Johnson (JAJ)

DATE: 1966 June

DOC#: JAJ130

DOCUMENT DESCRIPTION: Journal Article - Massive Talc Aspiration

#c Indexed

Massive Talc Aspiration

Successful Treatment With Dexamethasone

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FATALITIES HAVE been reported following the aspiration of talcum powder in infants.[1-3] The incidence of nonfatal illness from the inhalation of this dusting powder is unknown. Because of the ready availability of this substance and since the clinical manifestations from aspiration mimic those of acute infectious bronchiolitis, it is likely this etiology may sometimes be overlooked in milder cases.

Talc is hydrous magnesium silicate, and commercially, the mineral talc is usually mixed with other silicates such as serpentine, tremolite, anthophyllite, and other ingredients, predominantly carbonates. Talc is insoluble, chemically inert, and, in a fine state of subdivision, it is used topically as a "mechanical protective." It acts mainly by preventing friction and by absorbing moisture, but otherwise has no therapeutic effect.

Inhalation of talc dust may result in acute or chronic lung disease. Sudden massive inhalation produces acute respiratory distress of the bronchiolitis fibrosa obliterans type[4] which is often fatal. Sustained inhalation of significant amounts of talc can produce pneumoconiosis (talcosis). The case herein presented is of the former type in which an infant accidently inhaled a large amount of talc dusting powder and suffered acute respiratory distress. The course of this infant's illness, similar to the reported fatal cases, seemed to be favorably influenced by treatment with dexamethasone (Decadron).

Report of a Case

A healthy 14-month-old white male infant was playing with a can of talcum powder on Sept 24, 1965. At 9 AM the mother was attracted to the infant because of coughing and gasping. The face was covered by and the mouth was "caked" with the powder. He vomited a small amount and by 10 AM appeared to be in slight respiratory distress. After receiving an emetic in a community hospital, he was returned home. By afternoon the infant was having more difficulty in breathing and was taken to the family physician who administered an antibiotic to prevent infection. The dyspnea did not abate and the patient was admitted to Louisville General Hospital at midnight.

On examination the infant was in moderate respiratory distress, very restless, and irritable. The rectal temperature was 101 F (38.3 C) pulse, 160/min; blood pressure, 120 (systolic) by palpation method; and the rate of respiration was 44/min. The mouth and pharynx were normal. There was moderate intercostal and subcostal retraction. Air exchange was fairly good but expiration was prolonged. No rales were detected. The abdomen was not distended, and the liver and spleen were not enlarged. There was no cyanosis but the baby coughed frequently. A roentgenogram of the chest at the time of admission revealed no abnormalities other than signs of moderate hyperinflation. The hemoglobin was 8.6 gm/100 cc; and the white blood cell count was 17,000/cu mm, with 51% neutrophils, 37% lymphocytes, and 12% monocytes. The red blood cells were hypochromic and the hematocrit was 29% and reticulocyte count, 1.4%. Dietary history substantiated the impression of iron-deficiency anemia.

Upon admission the patient was placed in a tent with oxygen mist. There was no evident response to 0.15 ml aqueous epinepherine injected subcutaneously. A dose of 300,000 units of procaine penicillin G were administered twice daily. Isoproterenol (Isuprel), 2.5 mg, was given orally every six hours.

Twenty-four hours after the aspiration, the infant was in severe respiratory distress with marked retractions of the chest. He was slightly cyanotic and the respiratory rate was between 80 and 90 per minute. With the hope of enhancing bronchodilation and reducing inflammation, 2.0 mg of dexamethasone was administered intramuscularly and continued every 12 hours for seven doses.

Within 6 to 12 hours after initiation of steroid therapy, improvement was definite and the respiratory rate was between 40 and 60 per minute. Continued improvement came rapidly and dexamethasone was discontinued on Sept 29, 1965. On this date and afterward the infant was asymptomatic and without respiratory distress. Examination on October 7 revealed no symptoms nor physical abnormalities; the chest roentgenogram was normal, and the hemoglobin had increased to 12.0 gm/100 cc with oral iron therapy.

Comment

The case presented here followed a course similar to all the reported cases of fatal talc aspiration up to the time when therapy with dexamethasone was initiated. Improvement

Received for publication Jan 5, 1966.
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JNJTALC000438719

appeared to follow administration of this drug. The most recently reported case by Jenkins[3] in 1963 was that of a 14-month-old infant, who had coughing and some respiratory distress immediately after aspiration of talcum powder, and was hospitalized five hours later with grunting respiration with a rate of 48/min and intercostal retraction. Respiration became increasingly more labored and finally ceased ten hours after the aspiration. Molnar and coauthors' case was a 22-month-old Negro boy whose respiratory rate reached 90/min, seven hours after admission, and death occurred 20 hours after aspiration of the talcum powder. Cless and Anger's[1] case followed an identical course. Antibiotics, oxygen mist, digitalis, morphine, and epinepherine had no demonstrable effect on these cases.

Pathologically, lesions of bronchitis and acute bronchiolitis have been demonstrated in the fatal cases, with pulmonary edema, focal atelectasis, and compensatory emphysema. The bronchial and bronchiolar lumens and alveoli may be filled with a homogenous basophilic matrix embedded with leukocytes, epithelial fragments, and refractile particles. Complete desquamation of the epithelium in many bronchi is seen with various gradations of edema, hyperplasia, and squamous metaplasia. The submucosa is swollen and often infiltrated with polymorphonuclear leukocytes and refractile particles of talc.[2] The pathological changes seen in talc pneumoconiosis have been described as both cellular and fibrotic reactions affecting primarily the alveoli, smaller bronchioles, and arterioles.[5]

Umbilical granuloma has been described secondary to the free use of talcum powder over the trunk and diaper areas of newborn infants.[6] Surgeons are familiar with granulomatous reactions in the peritoneum from glove talc. Also, skin granulomas may result from talc deposited in an incision site.

Reasoning that led to the use of dexamethasone in this case was as follows:

1. Talc pneumoconiosis resulting from chronic exposure to talc in industry requires at least ten years before pulmonary fibrosis of clinical significance appears. It would seen that if, in an acute aspiration, the infant could survive two or three days, the respiratory tract would clear itself of most of the foreign material and further damage would be unlikely.

2. Adrenocortical steroids produce considerable temporary improvement in beryllliosis,[7] similar in some respects to talcosis.

3. An inflammatory reaction occurs in bronchi and bronchioles which might be reduced by dexamethasone.

If the favorable response to treatment was due to use of the steroid, it was probably due to the anti-inflammatory effect of the drug. Failure of response to epinepherine used prior to dexamethasone would suggest simple bronchodilation was not responsible for the improvement.

In conclusion, it is strongly urged that talcum powder be removed from the environment of children and the traditional association of talcum powder and babies be abandoned. It has no medicinal value; wherever placed it serves as a foreign body, and at least three deaths and an unknown morbidity have resulted from this silicate powder.

Summary

A case is presented of a 14-month-old infant who aspirated talcum powder, became severely dyspneic, and was successfully treated with dexamethasone. The clinical course is compared to the three fatal cases reported in the literature. There is no justification for the use of talcum powder in infant care.

Generic and Trade Names of Drugs

Dexamethasone—*Decadron, Deronil, Dexameth, Gammacorten, Hexadrol.*
Isoproterenol—*Aludrine, Isuprel.*
Procaine penicillin G—*Depo-Penicillin, Lentopen, Wycillin.*

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JNJTALC000438720