Poisoning by Oleoresin of Aspidium[1]

REPORT OF A CASE WITH POST MORTEM FINDINGS

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ASPIDIUM, or male fern, is obtained from *Dryopteris filix mass;* filicic acid is the most important of its active principles. The oleoresin of aspidium, or Extract of Male Fern, is the official U.S.P. preparation.[2] When given by mouth in liquid form, it produces nausea, vomiting, and diarrhea. Muscle tremors and tonic convulsions may occur, followed by depression of the respiratory center.[3] It has a direct depressant action on the heart.[4]

Apparently, susceptibility to this drug is individual, for severe poisoning has been produced by small doses, while no symptoms have occurred when doses as large as 20 g. have been given. Mild poisoning is characterized by nausea, vomiting, diarrhea, headache, dizziness, general weakness, weak and accelerated pulse, and moderate pallor. A more severe poisoning produces active vomiting and profuse diarrhea, with or without blood, followed by abdominal pains, muscle cramps, convulsive movements, loss of consciousness, and a pronounced peripheral vascular collapse. Death occurs from either cardiac or respiratory failure. Patients that survive may suffer from jaundice, renal damage, and temporary or permanent unilateral or bilateral blindness.[5]

Immediate attention is required when signs of peripheral vascular collapse or respiratory failure appear; evacuation of the intestines should follow right away. The administration of large amounts of liquids and plasma seems to be indicated, as the profuse diarrhea and vomiting brings about a pronounced state of dehydration.

Aspidium is usually administered in capsules or through a duodenal tube. An important precaution is to have the bowels properly cleansed so that the drug can act rapidly against the taenia. The patient should be instructed to take only a fat-free diet for two days prior to treatment and to drink large amounts of water with glucose, fruit juices, or weak tea. The bowels should be emptied with a

1. Received for publication January 19, 1943.

2. L. Goodman and A. Gilman, The Pharmacological Basis of Therapeutics, pp. 880–881 (New York: The Macmillan Company, 1941).

3. T. Sollmann, A Manual of Pharmacology, 5th ed. pp. 230–231 (Philadelphia: W. B. Saunders & Co., 1936).

4. L. Goodman and A. Gilman, *op. cit.*

5. T. Sollmann, *op. cit.*

saline purgative on each of the two mornings previous to, and by a large enema on, the morning that the drug is to be given. Purgatives are preferably given in the morning so as not to disturb sleep.

Some authorities believe that castor oil is not indicated for it hastens the absorption of the drug from the intestines,[6] while others believe that its toxicity is not increased.[7] Saline cathartics are preferred. If capsules are used, the estimated dose is given in the fasting state. Enteric coated capsules are preferred since nausea and vomiting can be avoided to a large extent and better results are obtained. 0.5 g. capsules at 10 minutes intervals are administered until the total dose is given. All the stools passed are collected and examined for the head of the taenia.

If the drug is administered through a duodenal tube, the following prescription is preferred: oleoresin of aspidium—4 to 8 g., powdered acacia—10 g., magnesium sulfate—30 g., and water—120 cc. After the tube has been introduced into the duodenum, one half of the dose is poured very slowly through the tube; 30 minutes later the rest of the dose is administered. In some instances, the medicine has been given in four equal parts at fifteen minutes intervals with about the same results. Sometimes the head of the taenia is passed with a first or second dose only. However, when the total dose is given, the tube is left *in situ* and 30 cc. of water are introduced every fifteen minutes. One hour after the last dose, 30 g. of magnesium sulfate are administered through the tube, which is then removed.

The dose of aspidium to be given is estimated according to the physical state of the patient. Usually, 4 to 6 g. of oleoresin can be administered without danger. In our experience, nausea and vomiting occur regardless of the method of administration or the amount given; the drug has a nauseating odor and is easily regurgitated. For children 0.5 g. per year of age is recommended.[8]

We very seldom repeat the treatment until two or three months have passed, as it takes this length of time to determine whether or not the first dose has been effective. Goodman and Gilman recommend at least seven to ten days as a rest period, while Sollmann states that several weeks should elapse before the treatment may be repeated. Male fern is contraindicated in infants, old persons, and in those suffering from chronic debilitating conditions, cardiovascular, renal or hepatic insufficiency.[9]

6. L. Goodman and A. Gilman, *op. cit.*
7. T. Sollmann, *op. cit.*
8. L. Goodman and A. Gilman, *op. cit.*
9. *Ibid.*

The following case, which well illustrates the toxicity of the drug and the advisability of prolonging the rest period between treatments to several weeks, is here presented. In this case, the development of profound peripheral vascular collapse occurred rapidly and unexpectedly; lack of plasma prevented us from using it on this patient. Autopsy findings are remarkable for their negativity, not an unusual occurrence in poisoning by anthelmintics.

CASE REPORT

E.M.–U.H. A–53. Age, 23 years. Admission, May 15, 1940.

The patient was seen for the first time at the Outpatient Department of the University Hospital on April 26, 1940. She then stated that, seven years previous, she had passed segments of taenia. She started to feel daily pains in the abdomen, accompanied at times by nausea and vomiting and had diarrhea with tenesmus, off and on. During all of this time she had had an excessive appetite, in spite of which she lost weight; she always felt hungry though she was always eating. She also complained of a peculiar sensation in the rectum, and as if something were swimming in her intestines.

Past History: Essentially negative, except for typhoid fever and malaria when she was 13 years old.

Physical Examination: A fairly well-developed, white Puerto Rican girl not apparently sick; weight, 118 lb. Blood pressure expressed in mm. of mercury: 124/80. Both anterior and posterior lymph glands of the neck slightly hypertrophied; tonsils large and chronically diseased. Spleen found palpable, and the edge of liver palpated two fingers' breadth below the right costal margin.

Laboratory Examinations: Hemoglobin: 91% or 13.2 g. (Hellige-Wintrobe)

R.B.C. . . . . 5,140,000 per cu.mm.
W.B.C. . . . . 7,450 per cu.mm.

Differential count:

Polymorphonuclear:
Neutrophils. 62%
Eosinophils 7%
Lymphocites 29%
Monocites 2%

Blood Kahn Test: Weak positive reaction.

Stools: Positive for eggs of *T. saginata*, *N. americanus*, and *T. trichiura.*

Urinalysis: Normal.

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On May 1, 1940, the patient was given a mixture of oleoresin of aspidium (6 g.), mucilage of acacia, and saturated solution of magnesium sulfate through a duodenal tube. She failed to retain the mixture in the duodenum, vomited several times, and became quite weak. However, she was able to go home.

On May 15, 1940, the patient returned to the Outpatient Department for another treatment with the emulsion of oleoresin of aspidium; 6 g. of the latter were given in 4 doses at fifteen minute intervals. Immediately after the first dose had been administered through the duodenal tube *in situ*, the patient had a small liquid bowel movement, and another one after the second dose. She complained of dizziness, so 7½ gr. of caffeine-sodium-benzoate were administered hypodermically, with immediate improvement. The other two doses of the emulsion were then given without any untoward immediate effect. One hour after the last dose, 30 g. of magnesium sulfate were given her through the duodenal tube.

The patient vomited immediately and had several waterish bowel movements in bed, becoming flushed in the face and covered with perspiration. Her respiration became irregular, infrequent, and labored, and she lapsed into a semi-stuporous state. She began to mumble every few minutes but on direct questioning complained, in an almost unintelligible tone, that she was numb all over. In view of her precarious condition, she was admitted to the women's ward of the University Hospital, where she arrived almost unconscious. She reacted to external stimuli, however. Immediate action was taken in an effort to save her life. She was put in shock position, covered with blankets and hot bags, and placed in an oxygen tent. A 10 percent glucose in saline solution was started intravenously. Caffeine-sodium-benzoate, 7.5 gr., was prescribed every two hours. The patient apparently reacted from the profound shock and was able to talk; she asked for some coffee which was given her. A few minutes later she had a profuse watery bowel movement. Three hours later her pulse became very weak, almost imperceptible, and the patient died in spite of all efforts to save her.

AUTOPSY REPORT[10]

Autopsy No. 1140.

Autopsy was performed 15¾ hours after death.

The body was that of a well-developed, well-nourished, white young woman, not remarkable externally, except for cyanosis of the

10. The autopsy was performed by Dr. Enrique Koppisch, Head of the Department of Pathology of the School of Tropical Medicine.

finger tips; the length was 157 cm. The mesenteric lymph nodes were all prominent but none measured over 1.4 cm. in maximum dimension, and the cut surfaces were pale and homogenous. Dense fibrous tags were present between the diaphragm and anterior aspect of the right lobe of the liver. Extensive fibrous adhesions fixed the right lung, laterally, to the parietal wall and, to a lesser extent, the mesial aspect of the right upper lobe to the mediastinum. The thymus was in keeping with the subject's age and presented practically no fatty or fibrous replacement.

The heart, aorta, pancreas, gall-bladder, suprarenal glands, kidneys, urinary bladder, uterus, vagina, oviducts, left ovary, pharynx, larynx, thyroid and parathyroid glands, thymus, appendix and brain were normal grossly.

GROSS EXAMINATION

Lungs: The left one weighed 480 and the right one, 510 g. Both were violaceous, especially in the posterior portions. On section they presented intense congestion and exuded a small amount of frothy fluid on pressure.

Spleen: It weighed 140 g. and was rather soft and flabby. The pulp was quite pale. The malpighian corpuscles were inconspicuous.

Liver: It weighed 1,570 g. and seemed slightly enlarged. The capsule was a little thickened over the right lobe anteriorly, in an area measuring some 8 by 10 cm., from which fibrous tags depended. The parenchyma was congested, more so in the right lobe, with indistinctly outlined lobules and a soft consistency, probably due to autolysis.

Right ovary: Showed enlargement to 4.5 by 3.2 by 2.2 cm. and felt cystic. Section disclosed a unilocular cyst with a smooth inner lining, a thin wall, and a diameter of 3.7 cm.

Esophagus: At the level of the larynx, the mucosa showed 2 or 3 small areas of superficial erosion, perhaps due to autolysis, since no congestion or exudate were present.

Stomach: It was moderately distended with clear fluid in which floated whitish and yellowish flecks. Throughout the fundus and body, autolytic changes of the mucosa were well advanced; elsewhere the rugae had been effaced to a considerable extent, and the mucous membrane was pale.

Small intestine: The mucosa was pale but otherwise normal. In the upper part of the jejunum there was found the proximal portion of a taenia, including the head, and measuring 5 cm. in length. The head was not attached to the mucosa.

Large intestine: It was moderately distended with clear fluid and contained a segment of a taenia 50 cm. long that comprised the larger proglottides. The parasite was identified as *Taenia saginata.*

Tonsils: They were slightly enlarged.

Trachea: The distal 2 or 3 cm. and the proximal parts of the main bronchi showed congestion of the mucosa and areas of superficial erosion that were covered by pale greenish material.

MICROSCOPIC EXAMINATION

Lungs: Many of the air sacs and bronchioles contained numerous polymorphonuclears and red blood cells.

Trachea: The epithelium had desquamated. The subepithelial tissue was edematous and infiltrated in places with small numbers of round cells that also surrounded some of the glands.

Liver: The sinusoids were intensely congested. Many of the liver cells contained minute fat globules.

Anatomical Diagnosis: Taeniasis (*Taenia saginata*); hemorrhagic bronchopneumonia, early; congestion and edema of lungs; fatty liver, early; simple cyst of ovary, right; fibrous pleural and peritoneal adhesions.

SUMMARY

The use of oleoresin of aspidium in the treatment of taeniasis and its toxic effects is discussed. A case of acute poisoning, with autopsy findings, is presented.