Medical Memoranda

A Fatal Case of Solanine Poisoning

Of the Solanaceae, *A. belladonna* (deadly nightshade) has long been recognized as having very poisonous properties owing to the high content of atropine in the plant. The commoner members of the *Solanum* genus—*S. dulcamara* (woody nightshade) and *S. nigrum* (black nightshade)—are generally regarded as being harmless, although the alkaloid solanine has been recovered from the berries of these plants and has been shown to have toxic properties in experimental animals and to a less extent in human beings. We can trace only one authenticated case of death from follow-up ingestion of the red berries of the woody nightshade and one fatal case of black nightshade poisoning (Taylor, 1875).

**Case Record**

A female child aged 9 years was admitted to hospital on the evening of Aug. 13, 1948, suffering from vomiting, abdominal pain, and distressed breathing. Her home was on the outskirts of a town and she was apparently in the habit of eating berries from hedges and from the embankment of a disused railway near her home. She had eaten berries on several occasions during recent weeks, the last occasion being three days before admission. The following day she had felt unwell but had improved. On the day before admission she had been taken ill with vomiting and had vomited "coffee-ground" material four times during the five hours before admission.

The child responded weakly to questioning and complained only of abdominal pain. She was somnolent, her skin was pallid and dry, her expression anxious. There were slight restless movements of arms and head. She was not delirious. A feature which remained marked throughout was dyspnoea. Inspiration was short and gasping; expiration was prolonged and active and accompanied by a sigh. The respiratory rate was 32 per minute. The pupils were of normal size and reacted to light. Although the child was dehydrated the tongue was moist. Examination of chest showed that some individuals may be abnormally sensitive to solanine. According to Reil (1857) solanine destroys life by producing paralysis of the muscles of the chest. It is a slow-acting poison, and so far as we know has not yet been isolated from the vomit or stomach washings of suspected cases. It differs from atropine (deadly nightshade) and hyoscyamine in not producing stupor or delirium, the pupils, sphincter paralysis, or pyrexia. Plants of the genus *Solanum* can be identified only by a botanical examination of the leaves and berries. The following brief accounts are extracted from Bentham and Hooker (1879). *Solanum dulcamara*.

**Synonyms:** Bittersweet, woody nightshade, felonwort, violet bloom, scarlet berry. Found commonly in hedges and thickets in moist shady situations throughout most of Europe except the extreme north. Common in England and Ireland. Rare in Scotland. Stem shrubby, climbing or straggling branches, often many feet in length. Leaves stalked, ovate or ovate-lanceolate, two or three inches long, usually broadly coriaceous at the base and entire, but sometimes with an additional lobe on the lower side. Flowers rather small, purplish and white or yellowish pink, with five petals, in loose cymes, on lateral peduncles shorter than the leaves. Flowers in summer. Berries small, globular or ovoid and red when mature.

**Solanum nigrum.** Synonym: black nightshade. One of the most widely spread weeds. Common in England but local in Scotland and Ireland. An erect annual or biennial with very spreading branches, about a foot high. In Britain usually glabrous. Leaves stalked, ovate with a stalk, base heart-shaped or cordate, and paler below. Flowers small, pale purple or blue with yellow anthers, in loose cymes, on lateral peduncles shorter than the leaves. Flowers in summer. Berries small, globular or ovoid and red when mature.

**References**


Five Cases of Belladonna Poisoning

On Sept. 2, 1948, at 10.30 a.m., three children, Rosamund and Elizabeth, aged 7, and John, aged 8, were admitted to St. Mary's Hospital, Portsmouth, having been taken ill the day before. Portsmout Hospital was a clean, small hospital with excellent facilities for the treatment of such cases. The children were in a clean, well-maintained environment. The children had been admitted to St. Mary's Hospital, Portsmouth, having been taken ill the day before. The hospital was a clean, small hospital with excellent facilities for the treatment of such cases. The children had been admitted to St. Mary's Hospital, Portsmouth, having been taken ill the day before. The hospital was a clean, small hospital with excellent facilities for the treatment of such cases. The children had been admitted to St. Mary's Hospital, Portsmouth, having been taken ill the day before. The hospital was a clean, small hospital with excellent facilities for the treatment of such cases. The children had been admitted to St. Mary's Hospital, Portsmouth, having been taken ill the day before.

A post-mortem examination was carried out two hours after death. The main feature was an acute inflammation of the mucosa of the stomach and intestines, the inflammation decreasing in intensity towards the distal coils of small intestine and cecum. There were small haemorrhages in the mucosa of stomach and jejunum. The stomach contained about 1 pint (568 ml.) of dark brown fluid, and dark greenish-black semi-solid material was present in the upper coils of the small intestine. The abdominal contents were decreased in volume and became paler towards the distal end of the small intestine. The contents of the colon were normal in appearance. Small fragments of the skin of a berry were found microscopically. The rectum was empty. Other abdominal organs appeared healthy. Thoracic organs, with the exception of the lungs, which were congested and oedematous, appeared healthy. The brain was normal in appearance.
they were very tired and did not want tea; all complained of great thirst, but otherwise appeared to be normal. At 7 p.m. the children went to bed and slept. At 9 p.m. three were awake and extremely restless. Their speech was rambling, they complained of being unable to see, and John, who climbed out of bed, "kept falling about the room." The mother thought all of them had high temperatures.

The fourth child in the family remained unaffected, and during the morning directed us to a plot of waste ground where there were two large blackberry bushes covered with ripe berries. Entwined among the stems were several plants of deadly nightshade (Atropa belladonna) also bearing large black berries. The child stated that he had eaten one berry, but five more children had eaten a lot. Three of the five were the patients, and the fate of the other two was at this time unknown. Later during the morning the hospital was asked to admit a child, Keith, aged 9.

On arrival he was found to have a hot, dry skin, rapid pulse, and moderately dilated pupils inactive to light. He was extremely drowsy and resentful of any examination. The story was that this child had been blackberrying with the others. He had a large tea at 11 p.m. and went to bed at 9 p.m., apparently a normal child. At 2.30 in the morning he was found fighting with his elder brother. He talked incoherently, did not appear to know his parents, and kept picking imaginary objects off the bedclothes. At 4 a.m. he was given methylated spirit by the doctor, and remained drowsy up to his admission at 1.30 p.m.

Just after his arrival a fifth child, Derek, aged 6, was admitted with identical symptoms to the first three. He had returned from the blackberrying party about 7.30 p.m., had his supper, and went to bed. He was awake and vomited twice during the night. At 6.30 a.m. both parents went out, leaving the child in charge of an elder sister. The sister sought the help of neighbours about 12.30 p.m. because the boy was talking strangely. The onset of symptoms in this case must have been delayed for twelve to eighteen hours.

**TREATMENT**

On admission gastric lavage was carried out on all five children, first with plain water then with potassium permanganate solution, 10 gr. (0.65 g.) to the pint (568 ml.). This procedure induced vomiting, and over 30 berries were recovered from John's stomach and nearly as many from his two sisters. The berries, mixed with gastric contents, closely resembled raisins, but the seeds were smaller and darker than raisin "stones." No berries were recovered from Keith and Derek.

Rectal wash-outs with normal saline were also given, but no seeds or berries could be detected in the washings. Four hours later the gastric lavage was repeated, and several more berries were obtained from John and one of his sisters. At the end of the lavage a solution containing magnesium sulphate 90 gr. (6 g.) was left in the stomach.

By late evening there was no appreciable change in the children's condition; all were still extremely restless and hallucinated; pulse rates remained high, and they were all incontinent. The urine was dark and there was still retention. During the night they slept sporadically, and by 9.30 a.m. the next morning all, except John, were quieter and fairly co-operative, though suspicious and resentful of any examination. The children all complained of great thirst and two of severe frontal headaches; there was still a marked malar flush, but the pupils were smaller and showed a slight reaction to light. The saline aperient was repeated, and all had several bowel actions during the day; by evening large numbers of seeds and berry skins were still being passed by John and his two sisters. At a conservative estimate John must have eaten at least 40 berries, and his two sisters between 20 and 30.

The important features in these five cases of poisoning appeared to be: \(1\) The prolonged period between the ingestion of the berries and the appearance of symptoms. \(2\) The absence of any fever or respiratory depression and the prominence of the hallucinations. \(3\) The significance of "raisins" in the vomit—so unlike fresh deadly nightshade berries—might not have been appreciated in a case where no history of eating berries was obtainable. \(4\) The necessity for administering an emetic: many of the berries would have blocked the largest size of stomach tube.

E. H. MINORS, M.B., Ch.B., Resident Physician, St. Mary's Hospital, Plymouth.