Adverse Reactions to Sulfobromophthalein Sodium

Report of 2 Cases

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SULFOBROMOPHTHALEIN SODIUM (BSP†) is a diagnostic agent widely used to assess hepatic function. Since its introduction in 1925 by Rosenthal and White,1 the incidence of adverse reactions reported in the literature has been relatively low. However, in view of the fact that 8 cases of fatal reactions have been reported, the physician must maintain his vigilance whenever BSP is administered.

This paper presents 3 new cases of adverse reactions to BSP and a review of the literature.

CASE REPORTS

Case 1

D.H., a 48-year-old white male scrap dealer, was admitted on Mar. 18, 1964, with complaints of right chest pain and intermittent hemoptysis over the previous 2 months. Pertinent history revealed that he had had X-irradiation, laryngectomy, and radical neck dissection for carcinoma of the larynx. He had also had an episode of hypotensive reaction to a local anesthetic that lasted 17 days despite supportive treatment with metaraminol.

Because of an abnormal BSP retention (20.8%), a repeat BSP test was performed 2 weeks later. Ten minutes after injection of 7 ml of 5% BSP (5 mg./kg. body weight), the patient became extremely diaphoretic and dyspneic. He appeared pale but not cyanotic. His pulse could not be felt and heart tones were distant. However, he retained consciousness. He responded satisfactorily to 50 mg. diphenhydramine (Benadryl‡) and 0.2 ml. of 1:1000 epinephrine, S.C. To maintain his blood pressure, a slow intravenous infusion of 100 mg. hydrocortisone and 50 mg. of metaraminol in 5% dextrose in water was needed for 16 hr. An electrocardiogram revealed no change from previous recordings. The possibility of adrenal insufficiency was considered in view of prolonged hypotension (90/60 mm. Hg) and marked sensitivity to stress, but was ruled out by the presence of normal urinary ketosteroids after ACTH stimulation.

Case 2

E.O., a 74-year-old white male retired lawyer, was admitted on May 12, 1964, with complaints of acute urinary retention and dysuria. Significant medical history revealed that he had essential hypertension and degenerative joint disease. He denied having asthma, hay

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fever, or syncopal attacks, but he reported two instances of giant urticaria after injection of penicillin.

Physical examination revealed a blood pressure of 160/110 mm. Hg, marked kyphosis, and hepatomegaly. His acute urinary distress was relieved by retention catheter. In his diagnostic work-up, a BSP test was performed on June 1, 1964. About 3 min. after the intravenous administration of the dye at 5 mg./kg. body weight, he complained of feeling weak, then slumped in his wheel chair and did not respond to questioning. He appeared diaphoretic and pale, but not cyanotic. His blood pressure was 40/0 mm. Hg and his pupils were dilated. A blood sample was drawn for a blood glucose test while starting intravenous therapy of 5% dextrose in water containing 10 mg. diphenhydramine. His blood pressure increased to 80/40 mm. Hg. Norepinephrine (Levophed*) was added to the dextrose solution, and after several minutes the blood pressure rose to 180/80 mm. Hg. He regained his consciousness and complained of frontal headaches. His electrocardiogram showed no significant change and his serum glutamic oxalacetic transaminase (SGOT) and blood sugar were normal. Intermittent intravenous infusion of norepinephrine was discontinued 8 hr. later. The following morning he was alert and cheerful, and appeared in no distress.

Case 3

W.V., a 73-year-old male retired carpenter, was admitted on Jan. 25, 1964, for evaluation of an unhealed burn ulcer of the left hallux. He was known to be a chronic alcoholic with cirrhosis of the liver, arteriosclerotic heart disease, and diabetes mellitus. There was no history of allergy.

Liver function studies revealed that he had a BSP retention of 39.6% on January 28, 1964. Subsequent BSP tests resulted in 29% retention on Feb. 29, and 17% retention on Apr. 1, 1964. His eosinophil count ranged from 7% to 29%. Physical examination revealed a blood pressure of 150/70 mm. Hg, an irregular pulse rate of 88, a nontender but palpably enlarged liver, and a gangrenous toe with accompanying cellulitis. Liver function tests were re-evaluated in preparation for surgery. Fifteen minutes after an intravenous dose of BSP, 5 mg./kg. of body weight, the patient was not only extremely diaphoretic, but also cyanotic. Incontinence of urine occurred. He complained of severe low back pain. Blood pressure taken at that time, however, was satisfactory and the pulse remained irregular as before. In this episode no treatment was given, and within an hour his complexion improved and his backache subsided.

DISCUSSION

Different types of adverse reactions have been noted after the use of BSP. Reactions such as chills, headaches, and faintness were reported by Mateer.2 Urticaria, large wheals, and generalized erythema have been reported by de Andino.3 An analysis of 1221 injections by Stempien4 indicated that thrombophlebitis in the injected vein occurred in 0.6% of the injections. A severe coalescing morbilliform rash that developed after injection with BSP was reported by Deutsch.5 The first serious anaphylactoid reaction to BSP was not described until 1948, about 23 years after its introduction.6 The first death was recorded in 1956 by Bjørneboe.7 In all, 19 cases of adverse reaction to BSP have appeared in the literature, 8 of which have been fatal.

A review of the literature shows that half of the 8 patients with fatal re-