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Successful treatment of migraine attacks with intravenous injection of aspirin

Sir: Aspirin is occasionally used for prophylaxis1 and treatment2 of migraine attacks. Ross-Lee et al3 reported that oral administration of aspirin was usually or sometimes effective in aborting acute attacks in 42 of 61 patients with migraine. They also studied plasma levels in patients treated with aspirin and indicated that there was a general correlation between better relief from pain and higher plasma aspirin levels.

Intravenous aspirin (DL-lysine-acyetlsalicylate; Venopirin®) has been available in Japan since 1983. One vial of the agent contains 497 mg of aspirin. We used the aspirin in three patients and succeeded in promptly terminating migraine attacks.

Patient 1 was a 23-year-old male with classical migraine. His grandfather and mother had recurrent headache. The patient’s throbbing headache began at the age of 19. Attacks were preceded by scintillating scotoma which were severe, on the left side, lasting about 12 hours, occurring approximately once per month. Associated symptoms were nausea and vomiting. He was referred to our clinic 4 hours after an attack started because ergotamine tartrate was of little help. The pain was severe and required bed rest. One vial of the aspirin was injected. About 15 minutes after the injection, the headache disappeared completely without any side-effect.

Patient 2 was a 56-year-old female with common migraine. Her parents and brother had recurrent headache. The patient’s throbbing headaches began at the age of 20, and were moderate, on the right side, lasting about 12 hours, occurring approximately once per month. Oral administration of aspirin and dipyridamole usually had beneficial effect. She was referred to our clinic 2 hours after an attack started, because oral aspirin and dipyridamole were of no help. The pain was severe and required bed rest. One vial of the aspirin was injected. About 15 minutes after the injection, the headache disappeared completely without any side-effect.

Patient 3 was a 21-year-old female with common migraine. There was no family history of headache. The patient’s throbbing headache began at the age of 13, were moderate, on the right side, lasting about 12 hours, occurring approximately once per month. Associated symptoms were nausea and photophobia. She was referred to our clinic 3 hours after an attack started. One vial of the aspirin was injected. About 10 minutes after the injection, the headache disappeared completely with mild light-headedness.

Aspirin is a potent inhibitor of platelet aggregation4 and prostaglandin synthesis.5 If taken in the early stage of migraine attacks, it may be of benefit by inhibiting platelet aggregation which is thought to be the initial biochemical event of the attacks.6 At a later stage in the attacks, aspirin may inhibit prostaglandin formation and help relieve pain. Prostaglandin appears to play a part in migraine headache.3 The pain of migraine attacks in our three patients disappeared within 15 minutes after the intravenous administration of aspirin. The pain persisted in Ross-Lee’s patients for about 2 hours following oral administration of aspirin before there was beneficial effect. The rapid effect of our treatment was remarkable. The effect may be attributed to the prompt inhibition of prostaglandin because the severe headache was established when the agent was used.

Zuker et al.8 studied effect of different concentrations of aspirin on human platelets. They indicated that over 28 μg/ml of aspirin was required to inhibit the platelet aggregation promptly. Intravenous injection of 497 mg of aspirin in humans produced high concentration in plasma of 80 μg/ml within one minute; after 5 minutes the concentration was 37 μg/ml.4 While peak plasma concentration of about 14 μg/ml was reached 20 minutes following oral administration of the same dose of aspirin.4 Cyclooxygenase is an enzyme in the synthesis of prostaglandin. Inhibition of the enzyme activity was studied in animals after intravenous and oral administration of aspirin (10 mg/kg).9 Marked inhibition was observed 5 minutes after the injection. However, the inhibition was not detected until 30 minutes after the oral administration. These findings seem to be the basis of the rapid relief.

Side-effects were slight and mainly restricted to nausea and perspiration in 5 of 75 patients who were treated with the intravenous aspirin for postoperative pain.10 Although our experience is limited, it suggests that the agent may be safe and effective in rapidly aborting migraine attacks.

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