

Short report

The spoon test: a simple bedside test for assessing sudomotor autonomic failure

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SUMMARY The efficacy of a new dual simple bedside test—the spoon test—in demonstrating sudomotor skin derangements was assessed. The results were compared with those defined by the quinizarine sweat test. The advantages and disadvantages of these two above and other known similar tests are discussed.

The autonomic system provides a fast-responding mechanism which controls other bodily functions. Patients with autonomic failure often have vague and imprecise symptoms. Autonomic function tests are invasive, cumbersome, time-consuming, and often difficult to interpret^{1,2} and their application has been experimental rather than clinical. Only a handful of cardiovascular reflex tests are suited to bedside use: blood pressure fluctuations during a Valsalva manoeuvre;³ heart rate variation with deep breathing;⁴ and response to postural change.⁵ These reflect cardiac parasympathetic supply. Sympathetic damage may be assessed by postural blood pressure changes and by the rise in blood pressure in response to sustained handgrip.^{6,7} Cutaneous vasomotor, pilomotor and sweating response abnormality indicates sympathetic derangement.⁸ Vasomotor function tests provide only limited information. The pilomotor response is easy to elicit but it is inconstant, and can only be demonstrated on face, hands and feet.⁸ The response to sweating may be observed by applying an indicator to the skin, which changes colour in the presence of moisture—iodine and starch,⁹ quinizarine,^{10,11} and tannic acid and ferric chloride.¹²

We describe a new, simple and effective bedside test which assesses sudomotor failure: the "spoon test".

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Patients

Ten patients admitted for management of intractable pain had somatic sensory parameters established to cutaneous pain and thermal stimuli. Three had suffered traumatic avulsion of the brachial plexus; three had intrinsic spinal cord tumours (two ependymoma, and one glioma); three had chronic arachnoiditis with nerve root compression, and the last had syringomyelia. Areas of sympathetic denervation assessed by the "spoon test" were compared with those defined by the quinizarine sweat test.

Methods and results

(a) *"Spoon test"* A kitchen soup spoon, with its curved surface resting on the skin, was held between the thumb and forefinger, and was drawn slowly on the skin, using sufficient energy to overcome its weight without lifting it from the skin. When "sympathectomised" skin was crossed, the pull was smooth and unopposed; but where sweat gland innervation and sympathetic function was intact, the skin was moist, and the flow of the spoon was interrupted, and became sticky requiring readjustment of the strength of pull. This change was easily detected, and was not influenced by the experience of the examiner, be he senior or junior doctor, nurse or student. The level of sympathetic denervation could thus be sharply defined, but this sudomotor level did not correspond to the cutaneous sensory level (Fig a).

(b) *Quinizarine sweat test* Quinizarine powder was sprinkled over the area of suspected abnormality and adjacent skin thirty minutes after the patient had been given 0.5 g of acetylsalicylic acid and a large quantity of hot tea. Room temperature was raised to 38°C by means of electrical heaters. Some patients preferred direct application of electric blankets. Over normal areas of skin with intact sweat glands, the quinizarine compound changed colour from white to deep purple within fifteen to twenty minutes. If sweat gland function was impaired, a patchy, mottled

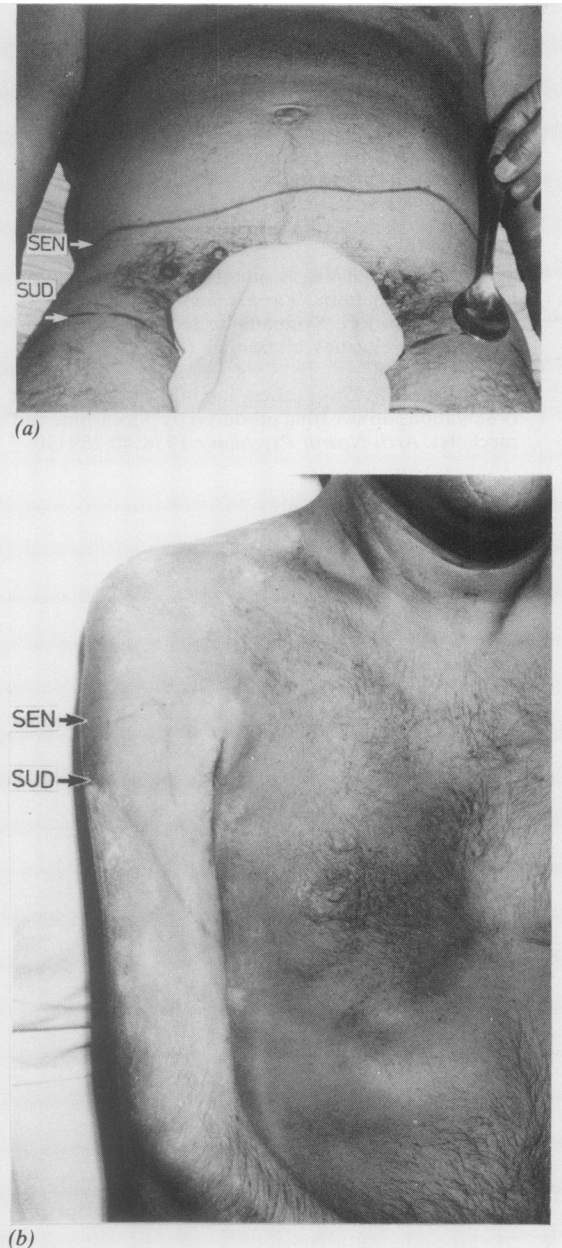


Fig (a) Demonstration of the spoon test to assess sudomotor (SUD) level in a patient with a spinal cord ependymoma. The somatosensory level (SEN) was defined by pinprick. (b) Quinizarine skin test on a patient with traumatic avulsion of the brachial plexus. The proximal sensory level (SEN) to temperature and light touch extends to the axillary crease. The sudomotor level (SUD) as defined by the spoon test corresponds to the quinizarine colour change from purple (normal) to white (abnormal).

pattern appeared; and if function was absent, no colour change occurred, and a clear-cut anhydrotic skin margin was evident, and in each case corresponded to the sudomotor level defined by the spoon test (Fig b). This test was uncomfortable for the patients, and often soiled their clothing.

Discussion

Indirect estimation of cutaneous sympathetic activity is possible by determination of cutaneous blood flow and the rate of sweat production. Cutaneous blood vessels and sweat glands are supplied by sympathetic fibres intermingled in the same fascicles but of different size and conduction velocity.¹³ Vasoconstrictor change is possibly separate from sudomotor change, expressed by alteration in sweat production and pilo-erection.

Assessment of sweat production in cases of spinal cord transverse lesions, using nociceptive stimuli such as faradisation in "spinal reflex sweating" is unpleasant and painful,⁶ while "drug sweating" with subcutaneous pilocarpine or mecholyl has unwanted side-effects.¹⁴ Thirst drugs may be variable in their effects, and sweating may be difficult to detect in the lower half of the body. Gustatory sweating induced by spicy foods affects mainly the face.⁸ The tannic acid test with ferric chloride tincture produces a messy black stain in the presence of sweat.¹² The quinizarine sweat test is similarly messy and unpleasant for patient and examiner, and both tests require application of heat, which is time- and energy-consuming, and sometimes unpleasant for the patient.^{10,11} The "spoon test", as described, accurately and objectively delineates cutaneous sympathetic abnormality of sweat secretion with no discomfort to the patient, without cost or mess, and is capable of reproduction by unskilled staff. It should be emphasised that the sudomotor level does not correspond to the somato-sensory level.

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