

Title: COMPLETE SYMPATHETIC BLOCKADE: SWEAT TEST OR SYMPATHOGALVANIC RESPONSE (SGR)?
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Introduction. Abolition of sweating and of the sympathogalvanic response (SGR) are the standards of test of complete sympathetic blockade.¹⁻² While the starch-iodine test is messy and cumbersome, the newer sweat tests, the cobalt blue² and ninhydrin³ tests appear fairly easy to perform. This study compared the reliability of the two sweat tests against the SGR as a sign of complete sympathetic blockade.

Methods. Patients with low back pain who had epidural steroid injections as part of their treatment were randomly assigned to one of two groups: 1) Group I-Control group given 6-8 ml of 0.9 normal saline with 80 mg methylprednisolone, 2) Group II-Sympathetic blocked group given 27-30 ml 1.5% lidocaine with the steroid. The following stimuli were used to elicit the SGR in every patient, in a random order: a) pin prick, b) loud noise, c) deep breath. The sweat tests were performed in the following manner: filter papers impregnated with either cobalt blue or ninhydrin were taped on the patient's toes. Sweating on the cobalt blue resulted in a change of color from blue to pink.² In the ninhydrin test, sweating appeared as purple dots on the filter paper after the paper was heated for 2 minutes. The SGR and sweat tests were done before and 15 minutes after the block. If the SGR and sweat tests were positive after the epidural local anesthetic injection, the tests were repeated 15 and 30 minutes later. Sympathetic blockade was assumed to be absent in group I patients and assumed to be present in group II patients. The absence of sweating or the SGR before the block in both groups and the disappearance of the SGR or sweating after the saline injection (group I) were considered false positive results. The persistence of the SGR or sweating after the local anesthetic injection (group II) was considered a false negative result. The sensitivity, specificity, and accuracy of these tests in confirming complete sympathetic blockade were evaluated.⁴ The study was approved by the Human Subjects Committee of Northwestern University and written informed consent was obtained from all the patients.

Results. Nineteen ASA physical status I patients were studied, 9 in group I and 10 in group II. Their ages ranged from 23 to 57 in group I and 22 to 56 in group II. In group II, the upper level of sensory blockade ranged from T4-T8 and extended to the S5 dermatome. In group I, 1 patient had a false positive SGR (no response) to deep breath before the block. After the epidural saline injection, 4 of the 9 patients had a false positive result (positive response which became negative after the injection) to the SGR; 3 of the 4 patients had a false positive result to one of the 3 stimuli, one

patient had a false positive response to all 3 stimuli. In comparison, there was no false positive result on the sweat test before and after the epidural saline injection, i.e. all patients sweat. In group II, 3 patients had a false positive SGR response before the block; 2 of the 3 patients had no response to 1 stimuli while 1 patient had no response to 2 of the 3 stimuli used. There were no false positive sweat tests before the epidural local anesthetic injection. In 9 of the 10 patients, their sweat tests became negative and their SGR were abolished. In 1 patient with a sensory level of blockade of T5, the sweat tests and the SGR to all 3 stimuli remained mildly positive. In all patients, it was noted that when one sweat test was positive, the other was also positive. The sensitivity of both the SGR and sweat test was 90%. The specificity of the SGR was 56% compared to 100% for the sweat test. The accuracy of the SGR was 74% compared to 95% for the sweat test. It was noted that the pink color of the cobalt blue filter paper (when sweating was present) returned spontaneously to the blue color within 3-10 minutes after standing. In comparison, the violet dots on the ninhydrin paper were permanent.

Discussion. We attempted a sensory level of blockade of at least T8 since a study documented the reappearance of sympathetic modality in the lower extremities when the level of analgesia regressed to T9 or below.⁵ Even with these high levels of sensory blockade, epidural anesthesia may not result in complete sympathetic block as shown by the patient who had persistent SGR and positive sweat test. Compared to the SGR, the sweat tests are more accurate and specific tests of complete sympathetic blockade.

References.

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