Stellate Ganglion Block for Posttraumatic Stress Disorder

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Q. What is stellate ganglion block?

A. Stellate ganglion block (SGB), also known as cervical sympathetic block, involves injection of local anesthetic to the stellate ganglion, a collection of nerves located between the C6 and C7 vertebrae in the neck responsible for regulating blood flow and for sensory processing in the head, neck, and upper limbs. SGB inhibits sympathetic activity and pain fibers to the upper body (Hanling et al., 2016; Peterson, Bourne, Anderson, Mackey, & Helfand, 2017). SGB is performed in an outpatient setting, and has been used to treat a variety of conditions, including complex regional pain syndrome, migraines, and hot flashes (Summers & Nevin, 2016). SGB has been proposed as an adjunct therapy in individuals with chronic posttraumatic stress disorder (PTSD) who have not responded to conventional therapies.

Q. What are the potential mechanisms of action underlying SGB for the treatment of PTSD?

A. The mechanism by which SGB may reduce PTSD symptoms is unknown (Hanling et al., 2016). The stellate ganglion is connected to regions of the brain that may be abnormally activated in PTSD, such as the amygdala. SGB may inhibit connections between the peripheral sympathetic nervous system and these regions of the brain (Peterson et al., 2017). The proposed mechanism explaining the apparent long-term effects of SGB on PTSD is that it causes reduction in nerve growth factor, resulting in a decrease in sympathetic nerve growth, leading to decreased brain norepinephrine levels, which is hypothesized to reduce PTSD symptoms (Hanling et al., 2016; Lipov, Candido, & Ritchie, 2017; Peterson et al., 2017).

Q. Is SGB recommended as a treatment for PTSD in the Military Health System (MHS)?

A. No. The *2017 VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder* states that there is insufficient evidence to recommend for or against SGB.

The MHS relies on the Department of Veterans Affairs (VA)/Department of Defense (DoD) clinical practice guidelines (CPGs) to inform best clinical practices. The CPGs are developed under the purview of clinical experts and are derived through a transparent and systematic approach that includes, but is not limited to, systematic reviews of the literature on a given topic and development of recommendations using a graded system that takes into account the overall quality of the evidence and the magnitude of the net benefit of the recommendation. A further description of this process and CPGs on specific topics can be found on the VA clinical practice guidelines website.

Q. Do other authoritative reviews recommend SGB as a treatment for PTSD?

A. No. Other authoritative reviews have not substantiated the use of SGB for PTSD.

Several other recognized organizations conduct systematic reviews and evidence syntheses on psychological health topics using similar grading systems as the VA/DoD CPGs. These include the Agency for Healthcare Research and Quality (AHRQ), Cochrane, and the VA Health Services Research & Development (HSR&D) Evidence Synthesis Program (ESP).

- AHRQ: No comparative effectiveness reviews include SGB as treatment for PTSD.
- Cochrane: No systematic reviews were found on SGB as a treatment for PTSD.
- VA ESP: A 2017 evidence brief on the effectiveness of SGB for the treatment of PTSD found that a number of encouraging results from case studies were followed up by a randomized controlled trial (RCT) with inconclusive results (Peterson et al., 2017).

Q. Is there any recent research on SGB as a treatment for PTSD?

A. A March 2021 literature search identified two randomized controlled trials (RCTs) of SGB for PTSD. The first compared SGB to sham SGB in 42 military service members with PTSD, finding no significant differences in PTSD symptoms between the groups after treatment (Hanling et al., 2016). This study had a number of methodological limitations, including high attrition, absence of key outcomes, and deviance from commonly used administration techniques for SGB (Peterson et al., 2017). The second RCT compared SGB to sham SGB in 113 active-duty service members with scores of 32 or greater on the PTSD Checklist (PCL; Rae Olmstead et al., 2020). SGB was administered at the start of the study, and again at two weeks, and posttreatment assessments were done at weeks four, six, and eight. The primary outcome was change from baseline to week eight in PTSD symptom severity on the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5). Mean change in PTSD symptom severity at eight weeks was significantly greater in the group treated with SGB than the group treated with sham. This was overall a methodologically rigorous study, but some limitations were lack of blinding of treating physicians, possible unblinding of participants due to side effects of SBG, and specific inclusion criteria that may limit generalizability.

Q. What conclusions can be drawn about the use of SGB as a treatment for PTSD in the MHS?

A. The research base for SGB is emerging. Recent publication of a methodologically rigorous multi-site RCT that found SGB may be effective in reducing CAPS-5 symptom severity is promising. Future research on long-term effectiveness, comparative effectiveness with current front-line PTSD treatments, cost-effectiveness, and implementation is needed to inform clinical practice guidelines or policy decisions within the MHS.

References

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