Vertebroplasty Trials

The Cochrane vertebroplasty review of April 2018 was replaced with an updated version in November 2018 to address complaints of errors in analysis. The updated version continues to misrepresent the evidence supporting early intervention with vertebroplasty for patients with uncontrolled, severe pain and fracture duration <6 weeks. The VAPOUR trial is the only blinded trial of vertebroplasty restricted to this patient group. It showed the benefit of vertebroplasty over placebo, particularly when the intervention occurred within 3 weeks of fracture. The Cochrane vertebroplasty review has ignored the positive outcomes in the VAPOUR trial. Open randomized trials of fractures <6-week duration support the positive findings of the VAPOUR trial. This is not described in the Cochrane review. The VAPOUR trial is clinically heterogeneous from other blinded trials. Cochrane protocol stipulates that clinically heterogeneous trials be described separately, as independent evidence, and not combined in analysis with dissimilar trials. Failure to observe this represents a serious protocol breach in the Cochrane review [1)].

Given the lack of consensus in the field, the American Society for Bone and Mineral Research (ASBMR) leadership charged a Task Force to address key questions on the efficacy and safety of vertebral augmentation and other nonpharmacological approaches for the treatment of pain after VF. This report details the findings and recommendations of this Task Force. For patients with acutely painful VF, percutaneous vertebroplasty provides no demonstrable clinically significant benefit over placebo. Results did not differ according to duration of pain. There is also insufficient evidence to support kyphoplasty over nonsurgical management, percutaneous vertebroplasty, vertebral body stenting, or KIVA®. There is limited evidence to determine the risk of incident VF or serious adverse effects (AE) related to either percutaneous vertebroplasty or kyphoplasty. No recommendation can be made about harms, but they cannot be excluded. For patients with painful VF, it is unclear whether spinal bracing improves physical function, disability, or quality of life. Exercise may improve mobility and may reduce pain and fear of falling but does not reduce falls or fractures in individuals with VF. General and intervention-specific research recommendations stress the need to reduce study bias and address methodological flaws in study design and data collection. This includes the need for larger sample sizes, inclusion of a placebo control, more data on serious AE, and more research on nonpharmacologic interventions. Routine use of vertebral augmentation is not supported by current evidence. When it is offered, patients should be fully informed about the evidence. Anti-osteoporotic medications reduce the risk of subsequent vertebral fractures by 40-70% [2)].

In 2018, based upon high- to moderate-quality evidence, the updated review does not support a role for vertebroplasty for treating acute or subacute osteoporotic vertebral fractures in routine practice. We found no demonstrable clinically important benefits compared with placebo (sham procedure) and subgroup analyses indicated that the results did not differ according to duration of pain ≤ 6 weeks versus > 6 weeks.Sensitivity analyses confirmed that open trials comparing vertebroplasty with usual care are likely to have overestimated any benefit of vertebroplasty. Correcting for these biases would likely drive any benefits observed with vertebroplasty towards the null, in keeping with findings from the placebo-controlled trials.Numerous serious adverse events have been observed following vertebroplasty. However due to the small number of events, we cannot be certain about whether or not vertebroplasty results in a clinically important increased risk of new symptomatic vertebral fractures and/or other serious adverse events. Patients should be informed about both the high- to

moderate-quality evidence that shows no important benefit of vertebroplasty and its potential for harm [3].

While evidence supports the efficacy of vertebral augmentation (kyphoplasty and vertebroplasty) for the treatment of osteoporotic fractures, randomized trials disputed the value of vertebroplasty.

Papanastassiou et al., made an analysis to determine the subset of patients that may not benefit from surgical intervention and find the optimal intervention time.

27 prospective multiple-arm studies with cohorts of more than 20 patients were included in this meta-analysis. They hereby report the results from the metaregression and subset analysis of those trials reporting on treatment of osteoporotic fractures with kyphoplasty and/or vertebroplasty.

Early intervention (first 7 weeks after fracture) yielded more pain relief. However, spontaneous recovery was encountered in hyperacute fractures (less than 2 weeks old). Patients suffering from thoracic fractures or severely deformed vertebrae tended to report inferior results.

They conclude that intervention in the hyperacute period should not be pursued, while augmentation after 7 weeks yields less consistent results. In cases of thoracic fractures and significant vertebral collapse, surgeons or interventional radiologists may resort earlier to operation and be less conservative, although those parameters need to be addressed in future randomized trials [4].

Vertebroplasty and kyphoplasty are similar medical spinal procedures in which bone cement is injected through a small hole in the skin (percutaneously) into a fractured vertebra with the goal of relieving back pain caused by vertebral compression fractures. It was found not to be effective in treating osteoporosis-related compression fractures of the spine in the only two placebo controlled and randomized clinical trials [5].

The patients in both the experimental and placebo groups of the blinded study reported improvement in their pain, suggesting that the clinical benefit noted in unblinded trials is related to the placebo effect. Costs of the procedure vary between 3,000 USD and 16,000 USD depending on what is done

References

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