



IQWiG Reports – Commission No. N14-04

Procedure for lung volume reduction in severe lung emphysema¹

Extract

¹ Translation of the key statement of the final report N14-04 *Verfahren zur Lungenvolumenreduktion beim schweren Lungenemphysem* (Version 1.0; Status: 7 February 2017). Please note: This document was translated by an external translator and is provided as a service by IQWiG to English-language readers. However, solely the German original text is absolutely authoritative and legally binding.

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Key statement

Research question

The aim of this report is to

- assess the benefit of surgical or bronchoscopic lung volume reduction (LVR) treatment versus conservative treatment or another lung volume reduction method

in patients with severe pulmonary emphysema with respect to patient-relevant outcomes.

Conclusion

For surgical LVR versus no additional therapy, there was an indication of benefit in the medium term (over 5 years) due to reduced all-cause mortality as well as proof of harm due to a short-term (up to 1 year postoperatively) increase in all-cause mortality. In terms of other outcomes, there were hints of benefit regarding dyspnea (as the only reported symptom of chronic obstructive pulmonary disease [COPD]) and exacerbations as well as indications of benefit regarding improved exercise capacity and health-related quality of life. When compared to pulmonary rehabilitation, there was also a hint of benefit of surgical LVR regarding dyspnea and exercise capacity, but no hint of benefit or harm regarding health-related quality of life. For all-cause mortality and exacerbations or other adverse effects, there were no hints of benefit or harm, albeit the available data were insufficient. Reports on the results on other adverse effects were generally insufficient.

The data on the 6 bronchoscopic procedures examined as an adjunct to therapy are not very meaningful overall. For the individual intervention types, only short-term results (3 months to 1 year), some only from single studies, could be used. There was no hint of benefit or harm for any of the procedures as regards mortality; the procedures varied in terms of the outcomes symptoms (dyspnea), exacerbations, exercise capacity, health-related quality of life, and other adverse effects. For adjunct bronchoscopic LVR with unilateral use of endobronchial valves (EBV) with the goal of complete occlusion, a total of 6 studies resulted in an indication of benefit regarding exercise capacity as well as a hint of benefit regarding health-related quality of life. On the other hand, there is proof of harm regarding increased other adverse effects and (for the comparison without sham control) a hint of harm regarding increased exacerbations (no hint of benefit or harm regarding the other outcomes).

For bronchoscopic lung volume reduction (BLVR) with bilateral use of intrabronchial valves (IBV) with the goal of partial occlusion (2 studies), only a hint of harm regarding other adverse effects was found (no other hint of benefit or harm for any of the other outcomes). For BLVR with coils (3 studies), there was an indication of benefit regarding symptoms (dyspnea), but also a hint of harm regarding exacerbations as well as proof of harm regarding an increased incidence of other adverse effects. For 2 outcomes, proof of benefit (regarding exercise capacity) and indication of benefit (regarding health-related quality of life) were found for the subgroup of patients with a residual lung volume of at least 225% of the predicted value. For the subgroup of patients with a residual lung volume less than 225% of the predicted value, a

hint of benefit was found (regarding health-related quality of life). For the other outcomes, there was no hint of benefit or harm. For BLVR using polymer foam (1 study), there was a hint of benefit regarding exercise capacity and a hint of harm regarding increased other adverse effects (no other hint of benefit or harm for any other outcomes). For BLVR using airway bypass stents (1 study), there was no hint of benefit or harm regarding any of the outcomes. For BLVR by thermal vapor ablation (1 study), there was a hint of benefit regarding health-related quality of life and a hint of harm regarding exacerbations (no further hint of benefit or harm for any other outcomes).

Comparisons between surgical and bronchoscopic LVR methods were scarce or not available at all. The only comparison between bronchoscopic procedures (IBV unilateral versus IBV bilateral) showed a hint of benefit of unilateral valve implantation as regards symptoms (dyspnea), exercise capacity, and health-related quality of life. However, this comparison is of little objective use since it is unclear whether bilateral IBV is associated with a benefit when compared to sham therapy. For the comparison of video-assisted thoracoscopy (VATS) with median sternotomy, there was a hint of benefit of VATS as regards length of hospitalization.

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