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EDITORIAL COMMENT

The main problem with this meta-analysis is the comparison of 4 studies using 4 different machines, inclusion criteria and definitions of success. According to this meta-analysis a slower shock wave delivery rate of 60 shocks per minute improves outcome following lithotripsy for renal stones. Recent research suggests a slower rate may also reduce renal injury during lithotripsy.[1] It is worthwhile highlighting that stone size appears to affect outcome. By looking closer at the Pace et al data, the beneficial effect appears to be limited to those stones with an area greater than 100 mm^2 (reference 8 in article). Differences in success rates for stones smaller than this were nonsignificant, similar to the findings of our study (reference 11 in article). It also has to be remembered that a slower shock rate will increase treatment duration and may affect patient tolerance. A slower rate may be recommended for larger stones. However, the evidence for smaller stones is lacking at present.

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REPLY BY AUTHORS

We agree that the methodologies among the source studies are disparate, which can be important with a small meta-analysis of only 4 studies. The question is whether the methodologies differ to such an extent that they are not measuring the same phenomenon. We think the differences are not so profound. One of the strengths of a meta-analysis is that it allows data from diverse clinical trials to be synthesized to provide a broader perspective than is possible with data from a single institution or, in the present case, a single lithotriptor. Even with only 4 studies available, pooling the data enhances the power to detect relatively small, albeit clinically relevant effects, and limits the impact of individual biases.

Stone size is also important. Only Pace et al reported separate results for stones 100 mm^2 or greater and less than 100 mm^2, and only the former demonstrated a statistically significant improvement for the slower lithotripsy rate (reference 8 in article). We repeated the meta-analysis using their data for stones less than 100 mm^2, and noted a statistically significant improvement in the proportion of successes using the slower rate (pooled risk difference 7.8%, 95% CI 1.1, 14.4). We also analyzed whether stone size and the magnitude of the risk difference were correlated using maximum stone length as the size variable, and found no significant association across the studies. In the study by Davenport et al (reference 11 in article), who used size as the product of length $\times$ width, we assumed length = width, as this would give the most conservative result, ie the smallest value for maximum length.

It may be that the effect of a slower rate is less pronounced for patients with smaller stones, and it will be important for future authors to analyze results for small and large stone subgroups with adequate power. However, it is worth considering the entirety of the raw data of our analysis, because there have been no reports of an inferior outcome associated with a slower treatment rate (even within the subset with smaller stones in the study by Pace et al). Furthermore, the pooled data do suggest a clinically and statistically significant benefit for a slower treatment rate. However, the improvement in treatment outcome does have a price, which is increased treatment time.