

Letter

The Authors Reply: Relationship Between Spontaneous Passage Rates of Ureteral Stones Less Than 8 mm and Serum C-Reactive Protein Levels and Neutrophil Percentages

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To the editor:

I appreciate the comments of the author of the critique of "Relationship between spontaneous passage rates of ureteral stones less than 8 mm and serum C-reactive protein levels and neutrophil percentages." The purpose of our study was to assess the usefulness of C-reactive protein (CRP) and neutrophil percentages as an indicator of the spontaneous passage rates of ureteral stones that are less than 8 mm in size.

CRP is a nonspecific acute phase reagent for which plasma levels are severely elevated in proportion to the inflammatory stimulus. The normal concentration in healthy human serum is usually lower than 1 mg/dL and slightly increases with aging. Higher levels are found in pregnant women near the end of pregnancy, with mild inflammation and viral infections (1-4 mg/dL), and with active inflammation, bacterial infection (4-20 mg/dL), and severe bacterial infections and burns (>20 mg/dL) [1]. Likewise, the normal range of CRP in our institution is also lower than 0.5 mg/dL.

Angulo et al. [2] emphasized that the risk of early sepsis or occult sepsis is present if the CRP of the patients who have ureteric stones is elevated. In their study, the average CRP level of the diversion group was 13.9 mg/dL. In our study, however, the average CRP of the spontaneous passage group was 4.1 mg/dL and the average CRP of the no passage group was 8.3 mg/dL. The CRP levels of 90.3% of the patients (169 of 187 patients) were less than 5 mg/dL. Likewise, the stone sizes were smaller than those in Angulo et al. [2]'s study. In our study, we excluded patients who had acute or chronic infections. This shows that patients in our experiment had a lesser inflammatory state. Usually, the CRP level of the acute infection state is high. Chung et al. [3] studied the CRP level of patients who had

acute uncomplicated pyelonephritis. The average CRP level of those pyelonephritis patients was 11.8 mg/dL. Paick et al. [4] studied the CRP level of patients with acute pyelonephritis. The initial mean CRP was 11.4 mg/dL. They categorized acute pyelonephritis into 4 grades according to renal parenchymal involvement. The CRP of the patients who did not have renal parenchymal involvement was 3.7 mg/dL, that of cases with less than 25% involvement was 6.8 mg/dL, that of cases with involvement between 25% and 50% was 12.4 mg/dL, and that of cases with more than 50% involvement was 21.8 mg/dL. I think the patients who have no evidence of acute urinary infection or have low CRP are not in need of urinary diversion.

In the study by Angulo et al. [2], the mean CRP value was 4.7 mg/dL. Aldaqadossi [5] reported that the CRP of spontaneous stone expulsion patients was 1.6 mg/dL, and the CRP of the patients who failed to pass the stone spontaneously was 3.9 mg/dL. These CRP level divisions were similar to those in our study. But the limitation of our study was that we did not define the cutoff level of CRP that predicts the spontaneous passage of ureteric stones.

In many studies, stone size was the most predictive factor for spontaneous passage of ureteric stones. In our study, the mean stone sizes were not that different in either the spontaneous passage group or the no spontaneous passage group (3.7 mm vs 4.4 mm, $p=0.116$). Also, the majority of stones were very small. I think that the spontaneous stone passage in our study was not affected by the size of the stones.

Our institution follows the relationship of urinary stones and the CRP level. The results of this study are preliminary. In the future, we will report more advanced data when additional cases are studied.

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