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## Fever after shockwave lithotripsy--risk factors and indications for prophylactic antimicrobial treatment

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Purpose: To identify risk factors for fever after shockwave lithotripsy (SWL) and suggest guidelines for prophylactic antimicrobial treatment.
Patients and Methods: Between 1985 and 2007, a total of 15,324 SWL procedures were performed in our institution using the Dornier HM3 lithotripter. Because stone analyses were not available in the majority of patients, management of stones larger than 2 cm in diameter were excluded from this analysis to minimize the ratio of struvite stones as a possible cause for postprocedural fever. In this analysis, 11,500 SWL treatments were included. Clinical parameters before, during, and after treatments were prospectively registered using a computerized database. Potential risk factors for fever after SWL were evaluated.
Results: Fever >38.0 degrees C developed in 161 (1.4%) patients. The risk factors for fever after SWL were: A positive urine culture ($P < 0.05$), an indwelling nephrostomy tube or stent during the procedure ($P < 0.001$), lithotripsy of kidney or upper ureteral stones ($P < 0.05$) and preoperative symptomatic urinary tract infection (UTI) ($P < 0.05$) or sepsis ($P < 0.05$). Lithotripsy of mid and lower ureteral stones, stone size, and the use of ureteral catheters during the procedures were not associated with increased risk of fever after SWL.
Conclusions: Fever (>38.0 degrees C) develops in only 1.4% of the patients undergoing SWL. Therefore, prophylactic antibiotic treatment is not indicated in all patients. Selective prophylactic treatment is recommended in patients who present with UTI, kidney or upper ureteral stones, and those for whom a nephrostomy tube or stent is necessary.

**Editorial Comment**

At first glance, this paper suggests that the AUA statement regarding prophylactic antibiotics at the time of shockwave lithotripsy deserves further scrutiny. However, the great majority of stones treated with SWL in the United States are renal and proximal ureteral stones; which this study confirms may benefit from preoperative antibiotic prophylaxis. As ureteroscopic approaches to ureteral stones have been demonstrated to be more efficacious and more cost-effective, the use of SWL in this subset of patients would be less common.

The AUA statement for prophylaxis is based on Level 1a evidence - a metanalysis of eight randomized prospective controlled trials. The current study suggests that routine antibiotics need not be used for mid-ureteral and distal ureteral stones that do not have an indwelling ureteral stent or nephrostomy tube. As this select group likely represents a very small portion of patients treated with SWL, for practical purposes, routine prophylaxis remains warranted!

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