

# Difference in fever duration between elderly and non-elderly patients in acute uncomplicated pyelonephritis



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## Background

- ✓ According to the guidelines on urological infections by European Association of Urology (EAU), radiographic investigations of urinary tracts to rule out urinary obstructions or anomalies should be considered if the patients with uncomplicated pyelonephritis remain febrile after **72 hours** of appropriate antimicrobial treatment, although its level of evidence and grade of recommendation are very low.
- ✓ Differences in clinical improvement or duration of fever between elderly and non-elderly patients are often observed.
- ✓ Our aim was to reveal differences in time of defervescence after initiation of active antibiotics between elderly and non-elderly patients and to identify other predictors to determine the timing of imaging studies.

## Material / Methods

- We retrospectively reviewed charts of consecutive patients with uncomplicated pyelonephritis at St. Luke's International Hospital (tertiary care center with 520 patient beds) in Tokyo, Japan from July 2003 to October 2015.
- We investigated basic demographics, duration of fever, laboratory data, bacterial culture and susceptibility, severity of disease, presence of drug allergy, and clinical outcomes.
- Uncomplicated pyelonephritis was defined as follows: clinically diagnosed acute pyelonephritis in healthy female ( $\geq 18$  years old) with fever ( $\geq 37.5^\circ\text{C}$ ), and positive urine culture ( $\geq 10^5$  CFU/mL) or blood culture, excluding pregnant, immunocompromised patients (such as diabetes, liver cirrhosis, malignancy, using steroids and immunosuppressant), patients with urinary tract obstruction, urinary catheter and coexistence of other infections.
- Univariate analysis, the Kaplan–Meier method, log rank test, and Cox's proportional hazards model were performed.

## Results

- ❑ We identified 104 cases in total. Median age was 62 years old, and patients were divided into elderly group ( $\geq 65$  years old, N=48) and non-elderly group ( $< 65$  years old, N=56).
- ❑ Mean duration of fever was 40.1 hours (1.0 to 129 hours) in all patient and was significantly shorter in elderly group than in non-elderly group (26.1 vs 52.1,  $P < 0.001$ ).
- ❑ Only 2 patients (4%) remained febrile for 72 hours or longer in elderly group, whereas 13 (23%) in non-elderly group.
- ❑ Elderly group also had significantly higher BUN level and more severe disease on admission in univariate analysis but there were no significant difference in WBC count, CRP, susceptibility to initial antibiotics, drug allergy, or blood culture positivity.
- ❑ The result of our Cox's proportional hazards model suggested elderly and severity of disease were associated with the duration of fever after adjusting confounders (adjusted hazard ratio=3.1; 95%CI 1.9-5.1, adjusted hazard ratio=0.65; 95%CI 0.4-0.9, respectively).

Table1. Comparison of elderly and non-elderly patients

	Elderly ( $\geq 65$ years old) n = 48	Non-Elderly ( $< 65$ years old) n = 56	p-value
Age	79.1 (6.1)	40.0 (13.6)	<0.001
Fever Duration (hour)	26.3 (19.7)	52.1 (30.7)	<0.001
Severity, n (%)			<0.05
Non Sepsis	8 (16)	2 (3.5)	
Sepsis	33 (69)	52 (93)	
Severe Sepsis	5 (10)	1 (1.8)	
Septic Shock	2 (4.1)	1 (1.8)	
Positive Blood Culture, n(%)	23 (48)	23 (41)	0.554
Positive Urine Culture, n (%)	48 (100)	54 (96)	0.498
E.coli Positive, n (%)	41 (85)	53 (94)	0.181
Susceptible to ABx, n (%)	47 (98)	51 (91)	0.214
ABx Allergy, n (%)	0 (0)	4 (7.1)	0.122
BUN (mg/dl)	17.6 (6.1)	11.6 (4.8)	<0.001
Cr (mg/dl)	0.76 (0.2)	0.73 (0.2)	0.459
WBC (/ul)	11800 (4670)	13000 (5160)	0.247
CRP (mg/dl)	9.6 (5.6)	13.1 (9.1)	0.075

Figure1. Relationship between fever and time after initiation of antibiotics in elderly and non-elderly groups.

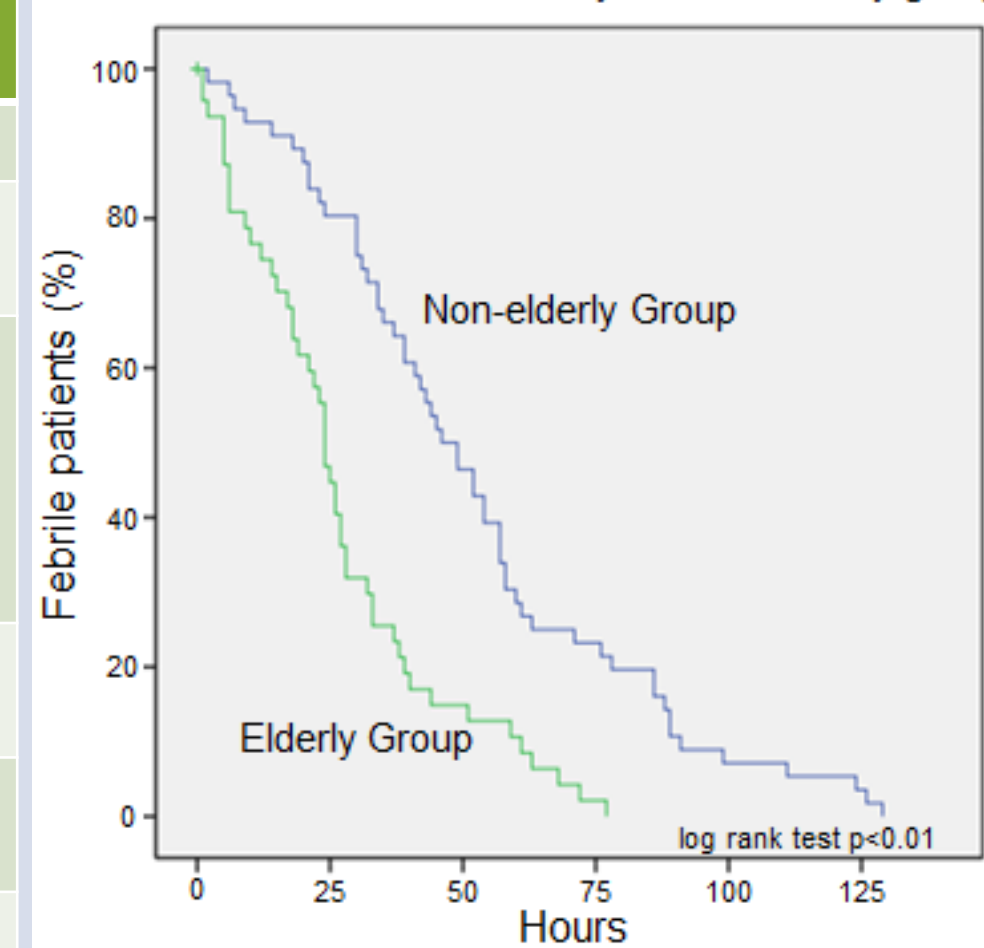


Table2. Fever Duration of elderly and non-elderly patients

	Elderly n=48	Non-Elderly n=56
>48 hours, n (%)	7 (15%)	28 (50%)
>72 hours, n (%)	2 (4%)	13 (23%)

## Conclusions

- ✓ Duration of fever in uncomplicated pyelonephritis **significantly varied depending on age** and **elderly patients became afebrile more quickly**.
- ✓ We should take this into consideration in deciding time to perform radiographic investigations. In elderly group, imaging study at 72 hours as per EAU guidelines may be acceptable, but **in non-elderly group, routine examination at 72 hours is not always recommended**.