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## Study on symptomatic urinary tract infection (UTI) among institutionalized elderly a prospective study

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## UTI as an important infection

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- Most common infection in residents of long term care facilities (Yoshihawa 1996)
  - Most frequent cause of sepsis and bacteremia in elderly (Yoshihawa 1984)
  - 8 to 30% of all nursing home transfers to acute care facilities (Stamm 1996)
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## Problems in diagnosis and treatment

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- Antibiotics treatments are directed to asymptomatic bacteriuria and for residents with non specific symptoms (Susan Walker 2000)
  - No difference in symptoms noted between subjects with bacteriuria and the same subjects when they had no bacteriuria (Berman 1987)
  - sending urine specimens for culture solely on the results of 'routine' urinalysis (Boscia 1986)
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## Diagnosis of UTI

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- typical symptoms of dysuria, urgency, and frequency are often lacking (Cumba 1998)
  - Chronic urinary symptoms are common in elderly (Nicolle 1999)
  - Based on the results of a careful clinical evaluation, a search for other diagnoses and the presence of new sign or symptoms localized to the genitourinary tract (Marion 1999)
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## Drug resistance

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- A high rate of antibiotics resistance especially the development of extended spectrum beta-lactamase (ESBL) uropathogens.
  - In HK, 6-23% for *Klebsiella pneumoniae* and 9-14% for *E coli* ESBL +ve (IMPACT)
  - ESBL can inactivate third generation cephalosporin and monobactams
  - often coexists with resistance to aminoglycosides and quinolones
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## Objective

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- to describe antibiotics prescription patterns, symptomatology, epidemiology and microbiological profile among symptomatic UTI in the institutionalized elderly
  - The risk factors and problem of antibiotics resistance were assessed
  - The incidence of bacteremia in the hospitalized patients for UTI and the risk factors were assessed
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## Method

- A prospective study from 1/6/04-31/1/05 covering both in- and out-patient cases of symptomatic UTI.
- 13 old age homes in the districts of Mongkok and Yaumatei covered by KWH CGAS and VMO project were included in this study (5 subvented home; 8 private homes)
- Aged  $\geq 65$  received antibiotics treatment for symptomatic UTI.
- Data collected by standardized questionnaires and urine samples were sent for bacteriological analysis

## Results

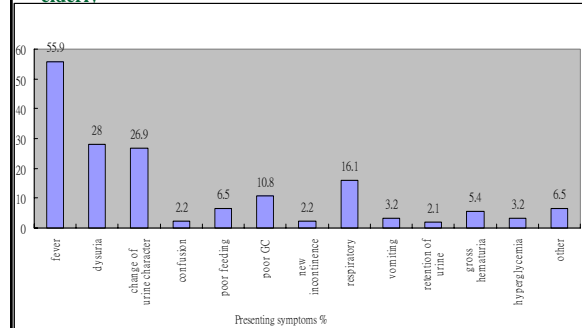
### Basic demographics:

- 93 subjects were enrolled; 59 in-patient and 34 out patient
- 40 of them came from subvented home and 53 from private homes
- female to male ratio was 68.8% vs 31.2%
- Mean age of subjects was 83.5, ranged from 68-98, SD 8.08.

### In private homes

- incontinence (67.9% vs 30%  $p < 0.001$ ); they tend to have more
- bed ridden patients (66% vs 47.5%  $p = 0.073$ )
- Admission (75.5% vs 47.5%  $p = 0.006$ ).
- Mean duration of hospital stay 9.1 days (SD 5.8 days)

### Presenting symptoms of symptomatic UTI in institutionalized elderly



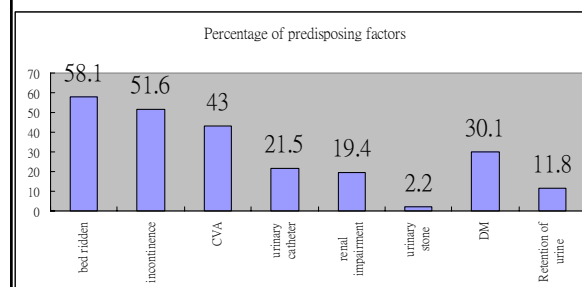
## Presenting symptoms

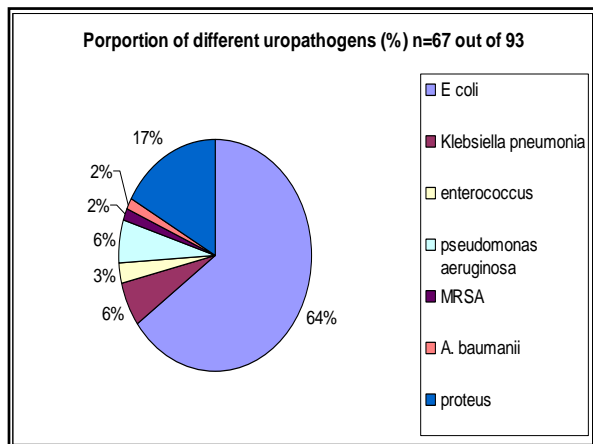
- Typical symptoms presented 30% subjects
- Fever was more likely to be hospitalized (84.6 % vs 36.7%  $p < 0.001$ ).

### Non-urological symptoms were present in 43%:

- respiratory symptoms (cough, CXR changes, shortness of breath)
- Vomiting
- Hyperglycemia
- Miscellaneous: seizure, check up, block foley, fast atrial fibrillation, infected bed sore, Influenza A Antigen +ve, knee inflammation, edema; one subject each.

### Prevalence of different predisposing factors for UTI





	% resistance isolates tested													
	ESBL	ampicillin	augmentin	cefuroxime	ceftriaxime	cephalexin	ciproxin	levofloxacin	gentamicin	amikin	nitrofurantoin	septrin	tiaman	fortum
E. coli (n=43)	18.6	86	25.6	27.9	25.6	44.2	11.6	48.8	30.2		6.9	55.8		
Klebsiella (n=4)	0	100									25	25		
Pseudomonas aeruginosa (n=4)	NA				20		100	50					50	50
Enterococcus (n=2)	NA													
Proteus (n=11)	27	72.7		45.5	18	45.5			27.3					
Acinetobacter (n=1)	NA						100	100	100				100	100

**Percentage of multi-drug resistant bacteria and risk factors**  
( N.B. only one culture +ve subject reported to have urinary stone)

Risk factors	Percentage of multi drug resistant bacteria		P Value
	Risk factor present	Risk factor absent	
Incontinence	40.5	37.9	0.83
Indwelling catheter	36.5	40	0.822
Bed ridden	35.1	44.8	0.422
DM	40	39.1	0.497
CVA	34.4	43.2	0.47
<b>Renal impairment</b>	<b>64.3</b>	<b>32.7</b>	<b>0.032</b>
ROU	63.6	34.5	0.071
BPH	28.5	25	0.512
Hospitalization	31.3	41.2	0.585
Antibiotics use	42.9	39	0.843

**Prescription Practice**

	In patient (n=56)	Out patient (n=37)
<b>Median Duration of treatment</b>	7 days (4-24)	7 days (5-7)
<b>Commonly prescribed empirical antibiotics</b>	Augmentin 28.8% Cefuroxime 22% Levofloxacin 13.6%	Augmentin 23.5% Ofloxacin 26.5% Nitrofurantoin 23.5%
<b>Other antibiotics</b>	Ampicillin, ciproxin, gentamicin, amikin, meropenem, septrin, timentin	Ampicillin, cefuroxime, cephalixin, ciproxin
<b>Empirical antibiotics corresponding to c/st (p=0.117)</b>	47.5%	44.1%

Empirical antibiotics failure associated with:

- ESBL production (57.1% vs 27.7%, p=0.009)
- BPH state (42.8% vs 20%, p<0.001)
- presence of indwelling urinary catheter tends to have non appropriate antibiotics (50% vs 26.3%, p=0.06).

- ESBL +ve in 19% growth of enterobacteriaceae species
- 58 % as “genuine UTI \*”, 13.9% would either had contaminated specimens or colonization.

\*significant pyuria (WCC>10/mL) and positive bacterial culture

## Bacteremia

- Most common presenting symptoms for taking blood culture was fever (88.6%).
- No association between positive blood culture and any presenting symptom ( $p>0.05$ ).
- Higher neutrophil count significantly associated with positive blood culture (median neutrophil count 13.8 vs 8.95,  $p=0.017$ ).
- Longer duration of hospital stay (median 12 days vs 7 days,  $p=0.034$ )

N.B: blood culture +ve in 11 out of 44 in patients

## Conclusion

- Treating asymptomatic bacteriuria may be a problem
- Avoid sending urine samples for culture as a routine investigation and for non-uological complaints
- Urine culture is helpful before deciding type of antibiotics
- Rational use of antibiotics, proper infection control measures, and avoid unnecessary use of antibiotics will obviously limit the emergence of antibiotics resistance organisms
- Neutrophil count is helpful in assessing bacteremia.