CARE-ICU - Controlling Antibiotic REsistance in Intensive Care Units

- First report from a web based program for improved infection control in European ICUs

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Objective

To report results from a European ICU surveillance programme with the aim to generate data for bechmarking and audit of microbial resistance, infection control procedures and antibiotic consumption.

Design

Observational study.

Interventions

None.

Settings, patients and participants

Thirty-four ICUs[1] from eight countries participated in the large pilot, which took place during 2005. The median annual number of admissions to ICU was 551 and the median summated length of stay was 2 595 days.

Measurements and results

Antibiotic consumption varied widely from 348 to 4 992 Defined Daily Dosages per 1 000 occupied bed days (DDD_{1000}), with a median of 1 254 DDD_{1000}. A median of 11.6% (range 0-100%) of S. aureus[2] were MRSA and the corresponding figures for ESBL phenotype (resistance to 3rd generation cephalosporins) of E. coli[2] and K. pneumoniae[2] were 3.9% (0-80%) and 14.3% (0-77.8%) respectively. Antibiotics to which more than 90% of isolates of a species were susceptible were defined as treatment alternatives (TA_{90}). More than half of all ICUs had no or only one TA_{90} for P. aeruginosa[2]. Screening for alert microorganisms in patients at risk on admission was commonly omitted, and there was a lack of single rooms for isolation and cohort nursing care of patients colonised or infected with alert organisms.

1 The ICU short names consist of the 2 character Internet top level domain name (Cz=Czech Republic, Ee=Estonia, Hr=Croatia, Hu=Hungary, Mt=Malta, Ro=Romania, Se=Sweden, Tr=Turkey) followed by 2 characters for the type of ICU (Me=Medical, Mx=Mixed, Ne=Neonatal, Ns=Neurosurgical, Ot=Other, Su=Surgical, Th=Cardiothoracic) and a sequence number.

2. Susceptibility was based on data for at least 5 isolates.

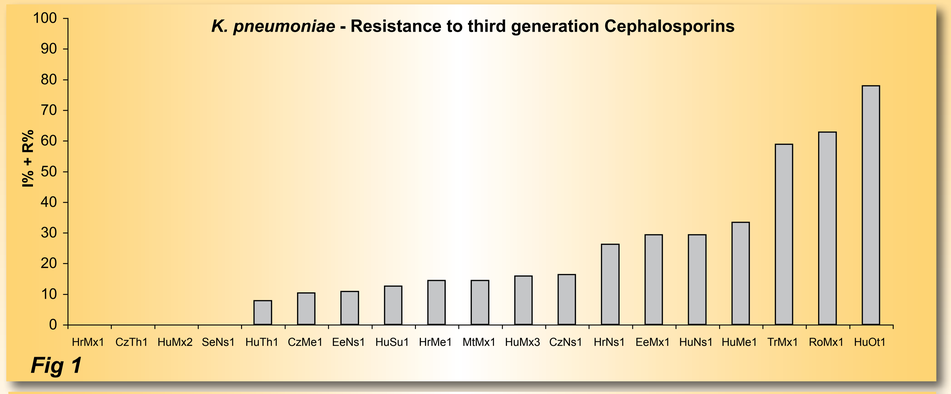

Fig 1

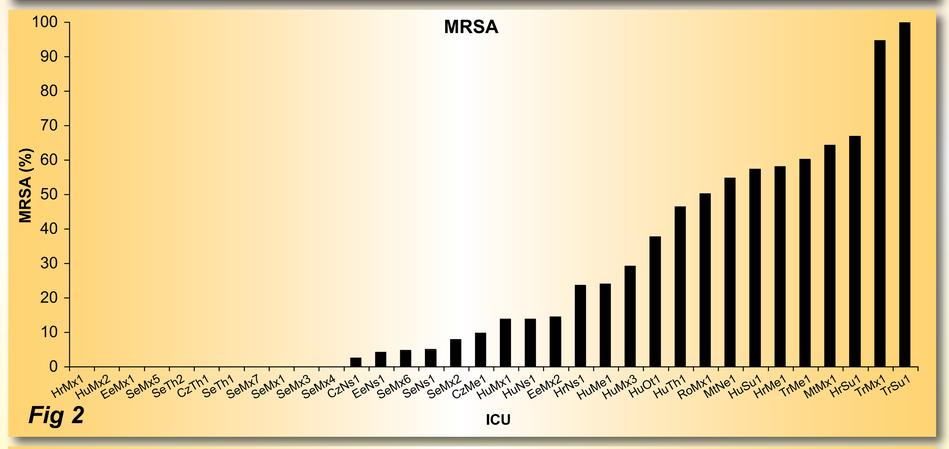

Fig 2

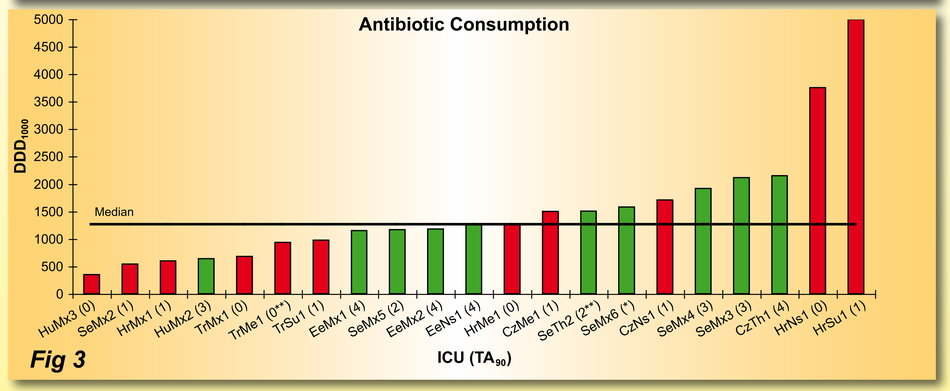

Fig 3

Fig 3. ≤ 1 TA_{90} including aminoglycoside, ceftazidime, ciprofloxacin and carbapenem against P. aeruginosa are denoted with red bars and TA_{90}>1 are denoted with green bars. Susceptibility was based on data for at least 5 isolates except for one ICU where no P. aeruginosa isolates were found (*) and two ICUs with < 5 isolates (**).

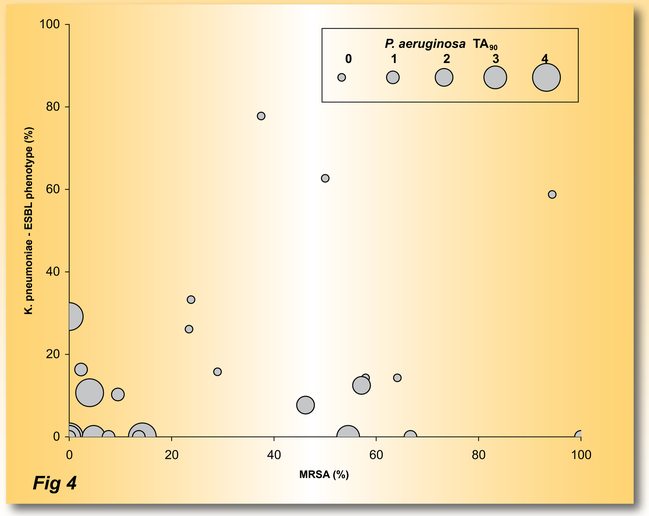

Fig 4

Fig 4. Frequency of MRSA, resistance to third generation cephalosporin in K. pneumoniae (ESBL phenotype) and TA_{90} in P. aeruginosa for each ICU. The bubble size indicates the number of TA_{90} for P. aeruginosa for each ICU.

Conclusion

The surveillance programme provided fast and easy access to results for benchmarking and comparative audit of antibiotic policy and infection control in participating ICUs.

This data can help to identify and establish interventions in infection control and antibiotic policy tailored for each individual participating ICU.

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