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Surgical site infections in "Queen Joanna-ISUL" University Hospital - etiological structure and antibiotic resistance, a part of INICC project

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Background: Objectives: To establish a surgical site infections (SSI) surveillance system as an element of internal and external analytic management participating Surgical Department and ICU from "Queen Giovanna-ISUL" University Hospital for aggregating into the international INICC database. We evaluate the trend of infection rates, structure and antibiotic resistance pattern. The goal of this study is to calculate the SSI rate per type of department and procedure, according with CDC-NHSN guidelines.

Methods: In order to provide data on SSI in INICC surveillance system the method of data collection is based on the CDC-INICC criteria. The infection control personnel were trained in the use of CDC definitions by paper cases. We continuously collected and calculated the data from surgical site infections.

Results: The rates of SSI in ISUL hospital were found to be comparable with rates reported by other countries in Europe. The total number of surgical procedures dropped from 1911 (2005) to 1713 (2010) operations per year during the study period. SSI rates in 2005 and 2006 were significantly higher (15.1% and 16.3%) compared to 13.4% (2010).Gram-negative aerobic organisms were dominant in our surgical department (ward and ICU) during the 2009 with *E. coli* (22.2%), *K. pneumoniae (*19.4%), *S. aureus* (12%), *P. aeruginosa* and *Acinetobacter sp*. (both 18%). The picture is dramatically different in 2010 when *K. pneumoniae* unexpectedly gaining force with incredible 28%, followed by *S. aureus* (19.7%) and *E. coli* -with only 16.2%. Susceptibility testing of isolates showed increasing resistance to selected antibiotics and high prevalence of ESBL producing strains of *E. coli* and *K. pneumoniae*. More strains of *Klebsiella spp*. with additional AmpC mode of resistance were tested. A relatively high resistance in non ferments such as *P. aeruginosa* and *Acinetobacter spp.* occurs.

Conclusion: Surgical site infection is not only a health but also a significant social and economic problem. We hope that our national and hospital efforts on infection control and efforts targeted at containment of resistance may bring the development of resistance to a half. These include optimal management of SSI, accurate diagnosis of infectious etiologies and judicious antimicrobial selection and utilization.dep

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Antiseptic resistance genes in *Staphylococcus aureus* from the elderly

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Background: Colonization with *Staphylococcus aureus* frequently precedes infection with this important pathogen. Treatment of infection has become more difficult due to dissemination of antibiotic resistant strains, especially methicillin-resistant *S. aureus* (MRSA). More recently, identification of genes which increase tolerance to disinfectants, including quaternary ammonium compounds (QACs), has increased concerns about cross resistance between antibiotics and antiseptics. Institutionalized elderly subjects have higher risk of MRSA colonization. This study compared staphylococcal colonization rates of elderly subjects in the community with those in elderly homes and determined antibiotic and antiseptic resistance.

Methods: Nasal and oral swabs were collected from 222 residents of four elderly homes and 113 attendees at an elderly day centre. Culture for *S. aureus* was performed and isolates characterized for methicillin resistance and presence of QAC genes, *qac*A/B and *smr*.

Results: *S. aureus* carriage rates varied significantly ($p = 0.001$) between elderly residing in homes (39.6%) and in the community (24.8%), the latter being similar to that of the general population in Hong Kong (24.0%). Living in an elderly home was associated with an increased risk of MRSA carriage (28.4%) compared with elderly in the community (2.7%; OR 14.6), although both rates exceeded that of the general community (<1%). *qac*A/B was present in 12.1% and *smr* in 10.8% of elderly home isolates, compared to 5.1% and 0% respectively in day centre attendees ($p<0.05$). Prevalence of both QAC genes was significantly higher for elderly home isolates than the general public and their presence was significantly associated with methicillin resistance, as well as resistance to ciprofloxacin, gentamicin, tetracycline and erythromycin.

Conclusion: MRSA carriage rates were much higher in elderly home residents than for elderly in the community. *S. aureus* isolates from elderly homes are more likely to harbor QAC genes, suggesting increased selective pressure for these determinants in elderly homes, as reported for hospital isolates. Such strains may pose an infection control risk by persisting on surfaces with low level antiseptic residues and contribute to the survival of MRSA. Disinfection practices in elderly homes must be performed correctly and staff trained in correct use of biocides.

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