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Paper Poster Session

Reducing cross-contamination and transmission

Risk factors for contact patients to become a carrier of multidrug-resistant organisms

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Background: Sometimes carriers of multidrug-resistant organisms (MDRO) have to stay in multiple bedrooms, either because they are still unknown carriers or due to a lack of single rooms. Close contact and shared surfaces may pose a risk for transmission of MDRO between room neighbors. We compared the risks for contact patients to have a positive screening result after sharing the room of an index patient for different MDRO.

Material/methods: In this observational study, room neighbors of MDRO-carriers with a contact time of at least 6 hours were screened for MDRO-colonization in a university hospital with approximately 3000 beds. Combined surveillance swabs from throat and nose were obtained to identify MRSA-carriers, and rectal swabs were obtained to identify VRE and Gram-negative bacteria such as multidrug-resistant *E.coli*, *K.pneumoniae* or *Enterobacter spp.* (MDR-ECO, -KPN, -ENB). Samples were analyzed using selective media and disk diffusion tests. Species identification and susceptibility testing was done using VITEK 2. We investigated possible risk factors in a multivariate analysis.

Results: During the study period between January 2014 and October 2015, 1950 contact patients were screened for MDRO carriage. Among these contact patients, 230 had positive screening results (11.8%). The median patient age was 66 years (IQR 50-76 years). Table 1 shows the results of both descriptive and multivariate analyses.

Conclusions: Although screening procedures do not differ between Gram-negative bacteria, contact patients of MDR-KPN-carriers were more than twice as likely to have a positive screening result as MDR-ECO-contacts. Male patients and patients in ICUs had a higher risk to have the same MDRO as their room neighbor compared with females and patients in non-ICUs. However, without admission samples and molecular analysis we should be cautious to interpret positive screening results in contact patients as transmission events. Some MDRO have high prevalence rates in the general population, and detected bacterial strains of the same species may have different genotypes.

Table 1: Descriptive and multivariate analyses of positivity rate among screened contact patients

	Number of contact patients	Number of contact patients with positive screening result (%)	Odds Ratio	95% Confidence Interval	
MDR- <i>Klebsiella pneumoniae</i>	187	38 (20.3)	5.68	3.20	10.08
MDR- <i>Enterobacter</i>	78	15 (19.2)	5.17	2.51	10.67

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MDR-other Gram-negative organism	59	10 (16.9)	4.29	1.89	9.74
Vancomycin-resistant enterococci	542	80 (14.8)	4.18	2.52	6.95
MDR- <i>Pseudomonas aeruginosa</i>	143	22 (15.4)	3.82	2.00	7.28
MDR- <i>Escherichia coli</i>	449	45 (10.0)	2.70	1.57	4.66
Methicillin-resistant <i>Staphylococcus aureus</i>	492	20 (4.1)	1.00 (Reference value)		
ICU	616	96 (15.6)	1.50	1.12	2.02
Male	1069	142 (13.3)	1.38	1.03	1.83

ICU = Intensive care unit