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1960. Antibiotic Challenge Dose Testing Improves Patient Care and Lowers Costs in a Community Hospital: A 2-Year Prospective Study

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Background. Penicillin allergy is reported in 10% patients in the US Patients with penicillin allergies are treated with broader spectrum antibiotics, often leading to more antibiotic-resistant infections, including *C. difficile*, increased risk of surgical site infections, and increased healthcare costs.

Methods. After informed consent, Medical-Surgical patients with documented allergies to penicillin (P) or cephalosporins (C) were given challenge doses through a standardized 2-step protocol from June 2015 to November 2017 at our community hospital. Patients with documented IgE-mediated hypersensitivity (HSR), rash or unknown reactions were eligible. Those with anaphylaxis or Type II-IV HSR were excluded. Treating clinicians selected the antibiotic for testing guided by the protocol: 323/336 patients (96%) were challenged with C. Based on results, allergies were updated in patients' charts, noting that tolerance of cephalosporins does not preclude penicillin allergy. Charts were reviewed to determine adverse events and antibiotic narrowing, the latter adjudicated by ID specialists not directly involved in the patient's care. A cost analysis used the acquisition cost of administered antibiotics before and after testing.

Results. 336 patients (53 Medical, 283 Surgical) underwent the allergy test dose protocol: 267 with reported P allergy, 47 C allergy, 22 P+C allergy. None had a major adverse reaction. 7 patients (2%) experienced minor reactions: rash (4), throat irritation (1), urticaria (1), wheezing (1). Before testing, 321/336 were prescribed inappropriate or broad antibiotics. After challenge dose testing, the antibiotic spectrum was narrowed in 308/321 (96%). The total Pharmacy cost savings was \$38,281.00 with the optimized antibiotic regimen, translating to \$630 saved per patient. In Surgical patients there was a 50% cost savings.

Conclusion. Despite the frequency with which β -lactam allergies are reported, few patients had an allergy that interfered with optimal treatment when tested. This standardized protocol can be safely performed in a community hospital setting and lead to improved antibiotic choice and pharmacy cost savings.

Reference

Iammateo M et al, *J Allergy Clin Immunol Pract*, November 2014; 2, 768-74.

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1961. A Randomized Controlled Trial of the Effect of Accelerated Copper Textiles on Healthcare-Associated Infections and Multidrug-Resistant Organisms: The "Investigating Microbial Pathogen Activity of Copper Textiles" (IMPACT) Study

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Background. Healthcare-associated infections (HAIs) and multidrug-resistant organisms (MDROs) remain critically important problems. Although copper has well-described antimicrobial properties, the impact of copper-impregnated linens on HAIs and MDROs in healthcare settings remains undefined.

Methods. This study was conducted in a 24-bed medical ICU and a 24-bed surgical ICU from 1/12/16 to 7/31/16. Six beds in each ICU were randomized to CottonX™ accelerated copper linens (flat sheet, fitted sheet, pillow cover, gown) (Argaman

Technologies Ltd.) and 18 beds to regular linens. Patients were enrolled if they were in the ICU for ≥ 3 days and were followed prospectively for development of an HAI (including *C. difficile* infection) and/or MDRO from ICU day 3 through 2 days after ICU discharge. MDROs were defined as a new clinical culture (i.e., no culture with the same organism in the prior year) with methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci, or ceftriaxone-resistant or carbapenem-resistant Enterobacteriaceae. A patient could be included more than once for distinct ICU stays ("episodes").

Results. Among 1,021 subjects, the median age was 61 and 448 (44%) were female. Of 1,205 total episodes, 678 (56%) were in the MICU, 527 (44%) were in the SICU, and 351 (29%) were randomized to copper rooms. There were no significant differences between study groups with regard to demographics, comorbidities, indwelling devices, or antibiotic use. The overall rate (per 1,000 patient-days) of the composite outcome (HAI or MDRO) was 11.66 and 15.44 in copper and non-copper episodes, respectively, [incidence rate ratio (IRR) = 0.76 (95% CI, 0.46, 1.19); $P = 0.22$]. Rates of HAIs were 10.26 and 10.41 for copper and non-copper episodes, respectively (IRR (95% CI) = 0.99 (0.57, 1.64); $P = 0.97$). Rates of MDROs were 3.73 and 6.51 for copper and non-copper episodes, respectively [IRR (95% CI) = 0.57 (0.23, 1.26); $P = 0.15$]. Results were consistent when stratified by type of ICU.

Conclusion. While not statistically significant, there was a nearly 50% lower rate of MDRO infection and colonization with use of CottonX™ accelerated copper linens, possibly in part due to decreases in environmental contamination. Future work should further explore the role of copper linens in reducing MDROs.

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1962. TRAIL Level and ImmunoXpert™ Score Complement Molecular Viral Detection in the Classification of Febrile Children: An Interim Analysis From the AutoPilotDx-Study

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Background. Differentiating between viral and bacterial etiology is essential in order to enable the adequate use of antibiotics. Previous studies showed that TNF-related apoptosis induced ligand (TRAIL) can serve as a useful biomarker for distinguishing between bacterial and viral infections when combined with IP-10 and CRP (ImmunoXpert™). Here we evaluate the potential of a new proteomic fingerprints in children with suspected viral and bacterial infections that had a confirmed viral detection.

Methods. In the prospective multinational multicenter study "AutoPilot-Dx" (NCT03052088) we aim to validate the diagnostic accuracy of the ImmunoXpert™ test. Infection etiology was assigned by majority adjudication of three experts based on comprehensive clinical and laboratory investigation. Viruses were detected using multiplex-PCR applied to nasopharyngeal swabs (Allplex™, Seegene). We performed an interim analysis of the first 134 febrile children recruited that had both PCR viral detection and etiology determination. TRAIL, IP-10, CRP and ImmunoXpert™ values were measured via a Tecan EVO75 ELISA platform.

Results. Bacterial diagnoses were assigned by the experts to 29%, 29% and 25% of patients with adenovirus (ADV), rhinovirus (RV), and respiratory syncytial virus (RSV) detection, respectively. Children with a viral infection including ADV, RSV, and RV had significantly lower ImmunoXpert™ scores as compared with children with a bacterial infection. Notably, TRAIL levels were markedly increased in viral infections as compared with bacterial infection, irrespective of the detected virus.

Conclusion. Classification of viral infections correlated significantly with elevated TRAIL levels and low ImmunoXpert™ scores. The differential expression of TRAIL in response to viral vs. bacterial infections can complement molecular viral detection, appears useful in the diagnostic workup for febrile children and may reduce antibiotic misuse.

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