CRITICAL ROUNDS

MICRO LABS LIMITED

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Dear Doctor,

Greetings from Micro Labs limited. We are happy to bring "CRITICAL ROUNDS" containing latest information in the field of Critical care medicine.

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Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Ltd

Interactions between carbapenems and valproic acid among the patients in the intensive care units

Objective:

To evaluate risk factors for epileptic seizures or epilepsy (SE) in patients concomitantly receiving Depokene (VPA) and carbapenems.

Materials and methods:

Adult patients within the medical care units (ICUs) who concomitantly received VPA and carbapenems from 2007 to 2017 were included. The impacts of various carbapenems on serum concentration of VPA were compared.

Results:

Among 162 patients included, 104 (64.2%) and 45 (27.8%) developed epileptic seizures and SE, respectively. The risk factors for epileptic seizures were age (per year increase, adjusted odds ratio [aOR], 1.03), initial antiepileptic regimen (monotherapy and polytherapy, aOR, 0.43 and 0.18, respectively), and VPA serum concentration after concomitant carbapenem administration (per 1 μg/mL increase, aOR, 0.96). VPA serum concentration after concomitant carbapenem administration was an independent risk factor for SE (per μg/mL increase, aOR, 0.98). Concomitant imipenem/cilastatin administration didn't significantly decrease VPA serum concentration compared thereto by meropenem or ertapenem. The length of stay and number of days on ventilation after concomitant carbapenem administration within the ICUs were significantly more in those with epileptic seizures or SE.

Conclusion:

Carbapenems decreased VPA serum concentration and increased the danger of epileptic seizures and SE, which led to increased length of ICU stay

Highlights:

- Decrease valproic acid concentrations concomitantly receiving carbapenems is known.
- Varying effects of different carbapenems on valproic acid serum concentrations.
- Imipenem/cilastatin has the least effect on serum valproic acid concentrations.
- Therapeutic drug monitoring is needed, when initiating or discontinuing carbapenems.

Source: Ling Chen et al; Interactions between carbapenems and valproic acid among the patients in the intensive care units. Journal of Critical Care Volume 62, April 2021, Pages 151-156

Risk Factors and Outcomes of Antibiotic-resistant Pseudomonas aeruginosa Bloodstream Infection in Adult Patients with Acute Leukaemia

Background:

Pseudomonas aeruginosa (PA) bloodstream infection (BSI) is a common complication in patients with acute leukemia (AL), and the prevalence of antibiotic-resistant strains poses a serious problem. However, there's limited information regarding antibiotic resistance, clinical characteristics, and outcomes of PA BSI in AL patients. This study explored characteristics related to the clinical outcomes of AL patients with PA BSI and analyzed factors related to BSI caused by multidrug-resistant (MDR) or carbapenem-resistant strains.

Methods:

This single-center retrospective study enrolled hospitalized AL patients who developed PA BSI during January 2014–December 2019. The Kaplan-Meier method was wont to plot survival curves. Multivariate logistic regression analyses were also performed.

Results:

Of 293 eligible patients with PA BSI, 55 (18.8%) received inappropriate empirical antibiotic therapy within 48 hours of BSI onset, whereas up to 65.8% MDR-PA BSI

patients received inappropriate empirical treatment. The 30-day mortality rate was 8.5% for all patients. However, the 30-day mortality rates were 28.9% and 5.5% in MDR-PA BSI and non–MDR-PA BSI patients, respectively (P < .001). On multivariate analysis, previous use of quinolones (odds ratio [OR], 5.851 [95% confidence interval {CI}, 2.638–12.975]) and piperacillin/tazobactam (OR, 2.837 [95% CI, 1.151–6.994]) were independently associated with MDR-PA BSI; and MDR-PA BSI (OR, 7.196 [95% CI, 2.773–18.668]), perianal infection (OR, 4.079 [95% CI, 1.401–11.879]), pulmonary infection (OR, 3.028 [95% CI, 1.231–7.446]), and age ≥55 years (OR, 2.871 [95% CI, 1.057–7.799]) were independent risk factors for 30-day mortality.

Conclusion:

MDR increases mortality risk in PA BSI patients, and former antibiotic exposure is vital in MDR-PA BSI development. Rational antibiotic use based on local antimicrobial susceptibility and clinical characteristics can help reduce antibiotic resistance and mortality.

Source: Yuanqi Zhao et al. Risk Factors and Outcomes of Antibiotic-resistant Pseudomonas aeruginosa Bloodstream Infection in Adult Patients With Acute Leukemia; Clinical Infectious Diseases, Volume 71, Issue Supplement_4, 15 November 2020, Pages S386–S393

Antimicrobial Activity of Ceftazidime-Avibactam Against Contemporary Pathogens From Urinary Tract Infections and Intra-abdominal Infections Collected From US Children During the 2016–2019 INFORM Surveillance Program

Background:

Antibacterial activity of ceftazidime-avibactam (CAZ-AVI) was evaluated against bacterial isolates from children within the us with a tract infection (UTI) or intra-abdominal infection (IAI) during the 2016–2019 International Network for Optimal Resistance Monitoring program. Prevalence of isolates and susceptibility to CAZ-AVI in paediatric and adult patients were compared.

Methods:

Bacterial isolates were collected from children with a UTI or IAI at 70 US medical centres from 2016 to 2019. The antimicrobial activity of CAZ-AVI and comparator agents was tested by broth microdilution methods.

Results:

The most prevalent Enterobacterales pathogens in children with UTIs were Escherichia coli (62.5%), Klebsiella pneumoniae (12.1%) and Proteus mirabilis (6.2%). Minimum inhibitory concentration 90% values for CAZ-AVI against Enterobacterales (0.25 µg/mL) and Pseudomonas aeruginosa (4 µg/mL) were identical for youngsters and adults. The most prevalent Enterobacterales pathogens in children with IAIs were E. coli (57.4%), K. pneumoniae (11.1%) and Enterobacter cloacae species complex (9.3%). All isolates of Enterobacterales from pediatric patients with UTI and IAI were susceptible to CAZ-AVI, including extended-spectrum β-lactamase phenotypes. Susceptibility of P. aeruginosa isolates to CAZ-AVI was 96.2% in children and 98.4% in adults with a UTI: for IAI it had been 100% and 97.2%, respectively.

Conclusions:

Contemporary UTI and IAI pathogens collected from US children from 2016 to 2019 exhibited similar prevalence and susceptibilities as isolates collected from adult patients. CAZ-AVI exhibited potent activity against these pathogens.

Source: Lin et al; Antimicrobial Activity of Ceftazidime-Avibactam Against Contemporary Pathogens From Urinary Tract Infections and Intra-abdominal Infections Collected From US Children During the 2016–2019 INFORM Surveillance Program. The Pediatric Infectious Disease Journal: December 21, 2020 - Volume Online First – Issue. doi: 10.1097/INF.0000000000003035