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Facing Neonatal Stenotrophomonas Maltophilia Infection: Trimethoprim-Sulfamethoxazole or Levofloxacin?

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Stenotrophomonas maltophilia, a multidrug-resistant gram-negative bacillus is an opportunistic organism. Infections caused by this pathogens needs to be treated promptly and is life-threatening in neonates (1, 2). The most common clinical presentations are pneumonia and bacteremia. Treatment includes limited number of antimicrobials with defined Minimum inhibitory concentration (MIC) cutoffs by US Clinical and Laboratory Standards Institute (CSLI).

These include trimethoprim-sulfamethoxazole (TMP-SMX), levofloxacin, ticarcillin-clavulanate, minocycline, ceftazidime and chloramphenicol (1).

Treatment of choice is TMP-SMX based on reliable in-vitro activity and favorable clinical outcomes (1, 2). Levofloxacin is a potential alternative to TMP-SMX (1). Usually we encounter high resistant rates to ceftazidime (3). Ticarcillin-clavulanate is not readily available in Iran. Also it is shown to be less active than TMP-SMX in vivo (2).

One of the concerns with sulfa antibiotics in neonates is the potential risk of hyperbilirubinemia and kernicterus (2, 4-6). The landmark study was in 1956 in which Andersen et al elucidated that premature infants receiving a penicillin/sulfisoxazole combination had a significantly higher rate of mortality and kernicterus compared with oxytetracycline (4). In the study by Thyagarajan et al., suggested that the concept of kernicterus and TMP-SMX remains a theory and needs to be further illuminated in trials. Based on their experience, who prescribed TMP-SMX for treatment of sepsis and pneumonia in newborns and infants in rural and tribal areas in India in a home-based neonatal care setting, no adverse effects, including any signs of central nervous system (CNS) toxicity was noted (6). There are also no dosing recommendations for TMP-SMX in neonates (2) and if used when facing stenotrophomonas maltophilia infection, it is used in an off-label manner.

So when we encounter stenotrophomonas maltophilia infection in neonates (term and preterm) with TMP-SMX being the first treatment choice, how could the risk-benefit assessment be judged?

When reviewing the literature there are case reports of treatment of neonatal stenotrophomonas maltophilia pneumonia with TMP-SMX with no report of kernicterus (2, 7).

One of the concerns with fluoroquinolones in children is the risk of arthropathy (8, 9). Bradley et al demonstrated that musculoskeletal toxicity 5 years after therapy with levofloxacin appear to be uncommon, clinically undetectable or are reversible in children (10).

So the challenge is selecting between TMP-SMX with risk of kernicterus and levofloxacin with risk of arthropathy when treating stenotrophomonas maltophilia pneumonia or sepsis in neonates when it is susceptible to both agents. Since the concern on kernicterus still remains, one conservative approach may be selecting levofloxacin over TMP-SMX in neonates. A recent systematic review and meta-analysis has shown comparable efficacy of fluoroquinolones on mortality to TMP-SMX for the treatment of stenotrophomonas maltophilia (11). Other approach may use combination therapy of TMP-SMX with levofloxacin because of high morbidity and mortality associated with this pathogen (2,7). Studies reporting experience regarding successful treatment of this pathogen in meningitis, sepsis, pneumonia or urinary tract infections in neonates are highly needed.

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