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Drug-Induced Liver Injury: It's Not All Acetaminophen

Eric Malone, Andrew King, Cynthia Aaron
Wayne State University / Children's Hospital of Michigan Regional Poison Control Center, Detroit, MI, USA

Background: Amoxicillin (an aminopenicilin) is a widely prescribed antibiotic with a side effect profile that is generally considered to be benign. We present a case of a child with amoxicillin-induced hepatitis and jaundice which worsened with in-hospital administration of piperacillin (a ureidopenicillin) and improved with discontinuation of antibiotics and initiation of steroid therapy.

Hypothesis: Amoxicillin-induced liver injury can be exacerbated by intravenous piperacillin.

Case: A 4-year-old previously health male with a past history significant only for atopic reactions to multiple xenobiotics, was treated with amoxicillin for an upper respiratory tract infection. Following cessation of therapy, he became jaundiced. He was referred to the emergency department of a pediatric tertiary care hospital. He was found to have significant transaminase elevations with an AST of 1458 U/L and ALT of 1373 U/L. Total bilirubin and direct bilirubin were elevated at 4.2 and 2.4 mg/dL, respectively. After transabdominal ultrasound was suspicious for acalculous cholecystitis, he was treated with intravenous piperacillin/tazobactam. Serum transaminases rapidly increased to AST >3500 and ALT to > >2000. Total and direct bilirubin peaked at 14.7 and 12.1 mg/dL. INR was 1.3, PTT was 33.0s, and PT was 15.3s . Extensive evaluation, including MRCP, viral titers, and serum markers for auto-immune diseases was non-diagnostic. Liver biopsy was suggestive of autoimmune or toxic causes. The patient's physical examination, aside from marked jaundice, was unremarkable. Penicillin-induced cholestatic hepatitis was suspected, piperacillin/tazobactam was discontinued, and intravenous steroids were started. All laboratory parameters rapidly improved and the patient was discharged home.

Discussion: Amoxicillin monotherapy is rarely implicated in liver injury with evidence of both hepatocellular damage and cholestasis. In this case, amoxicillin induced liver injury and cholestasis worsened following an unintentional challenge with piperacillin, suggesting potential cross-reactivity.

Conclusion: Amoxicillin monotherapy can result in significant transaminase elevations and hyperbilirubinemia. Idiopathic drug reactions should be considered in patients presenting with hepatitis, jaundice, and no other identifiable etiology. Other classes of penicillin antibiotics should be specifically avoided in patients with a history of amoxicillin induced liver injury.