

The Role of Glyceryl Trinitrate (GTN) in ^{99m}Tc-HIDA with Morphine Provocation Scan for the Investigation of Type III Sphincter of Oddi Dysfunction (SOD)

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Abstract : Type I SOD is usually diagnosed by anatomical imaging such as ultrasound, CT and MRCP. However, the types II and III SOD yield negative results despite the presence of significant symptoms. In particular, the type III is difficult to diagnose due to the absence of significant biochemical or anatomical abnormalities. Nuclear Medicine can aid in this diagnostic dilemma by demonstrating functional changes in the bile flow. Low dose Morphine (0.04mg/Kg) stimulates the tone of the sphincter of Oddi (SO) and its usefulness has been shown in diagnosing SOD by causing a delay in bile flow when compared to a non morphine provoked - baseline scan. This work expands on that process by using sublingual GTN at 60 minutes post tracer and morphine injection to relax the SO and induce an improvement in bile outflow, and in some cases show immediate relief of morphine induced abdominal pain. The criteria for positive SOD are as follows: if during the first hour of the morphine provocation showed (1) delayed intrahepatic biliary ducts tracer accumulation; plus (2) delayed appearance but persistent retention of activity in the common bile duct, and (3) delayed bile flow into the duodenum. In addition, patients who required GTN within the first hour to relieve abdominal pain were regarded as highly supportive of the diagnosis. Retrospective analysis of 85 patients (pts) (78F and 6M) referred for suspected SOD (type III) who had been intensively investigated because of recurrent right upper quadrant or abdominal pain post cholecystectomy. ^{99m}Tc-HIDA scan with morphine-provocation is performed followed by GTN at 60 minutes post tracer injection and a further thirty minutes of dynamic imaging are acquired. 30 pts were negative. 55 pts were regarded as positive for SOD and 38/55 (60%) of these patients with an abnormal result were further evaluated with a baseline ^{99m}Tc-HIDA. As expected, all 38 pts showed better bile flow characteristics than during the morphine provocation. 20/55 (36%) patients were treated by ERCP sphincterotomy and the rest were managed conservatively by medical therapy. In all cases regarded as positive for SOD, the sublingual GTN at 60 minutes showed immediate improvement in bile flow. 11/55(20%) who developed severe post-morphine abdominal pain were relieved by GTN almost instantaneously. We propose that GTN is a useful agent in the diagnosis of SOD when performing ^{99m}Tc-HIDA scan and that the satisfactory response to the sublingual GTN could offer additional information in patients who have severe pain at the time the procedure or when presenting to the emergency unit because of biliary pain. And also in determining whether a trial of medical therapy may be used before considering surgery.

Keywords : GTN, HIDA, MORPHINE, SOD

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