Pharmacologic Intervention in the Evaluation of Biliary Disorders with Emphasis on Chronic Acalculous Biliary Diseases

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Over the past decade, pharmacologic interventions have been increasingly used in conjunction with hepatobiliary scintigraphy to enhance the diagnostic information for the evaluation of acute and chronic calculous and acalculous biliary tract diseases.

Sincalide (Kinevac, Squibb Diagnostics, Princeton, NJ), a synthetic C-terminal octapeptide of CCK, has been used to evaluate gallbladder ejection fraction and/or sphincter of Oddi response in patients with suspected chronic, acalculous biliary tract diseases to determine who could benefit from cholecystectomy or sphincterotomy. Administration technique for sincalide is of utmost importance. Although the optimal dose and duration of infusion is the subject of some controversy[1, 2], a long infusion seems to produce more complete gallbladder emptying and less severe side effects than a short infusion, probably due to the 2.5-minute plasma half-life of sincalide.

Controvercies also exist over the use of CCK for the evaluation of chronic acalculous biliary disorders. The overall data, however, favor the use of this test for the diagnosis of chronic acalculous gallbladder and cystic duct disease as well as sphincter of Oddi dysfunction. A detailed discussion on this subject can be found in a recent review[3].

Recent data and reanalysis of the literature suggest that morphine augmented cholescintigraphy has a reasonably good, though imperfect, specificity and positive predictive value, which are significantly better than for delayed imaging, in addition to its logistical advantage (shortening the imaging time)[4-6]. Sincalide has also been used in the diagnosis of acute cholecystitis in order to empty the gallbladder before cholescintigraphy so gallbladder filling can be enhanced during the study if the cystic duct is patent[7, 8]. Sincalide pretreatment, when administered at the physiologic rate, will be helpful in conditions in which functional resistance to tracer flow into the gallbladder may be present. However, morphine-augmentation will further improve the efficacy of the test even after sincalide pretreatment[9-11].

There are certain conditions and medications that may affect gallbladder contraction [12-16]. Several variants associated with CCK preadministration and morphine have also been reported, which are often unrecognized by nuclear medicine physicians. These include:

1) delayed tracer excretion into the bowel associated with prompt and progressive

gallbladder filling after sincalide pretreatment[17],

2) morphine administration increases the frequency and the degree of duodenogastric reflux[18, 19].

3) variable degree and duration of bile retention on cholescintigraphy after morphine administration for evaluation of acute cholecystitis[20]. The impact of this variable or no visible effect of morphine on the efficacy of morphine-augmented cholescintigraphy is yet unclear, and further study will be necessary.

In summary, cholescintigraphy has played a pivotal role in the evaluation of various biliary tract diseases, particularly with increasing uses of pharmacologic intervention. The physician monitoring the study should employ the most optimal technique for the pharmacologic intervention, i.e., the dose and the rate of administration. Certain conditions and medications that may affect gallbladder contraction should be remembered. It is also important to be aware of the various physiologic and pharmacologic effects on imaging findings: not only those findings that are normal but also the undesirable variants. Failure to recognize such effects can lead to incorrect interpretations.

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