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THE NARDI TEST IN SPHINCTER OF ODDI DYSFUNCTION: IS IT STILL RELEVANT?

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Recurrent abdominal pain is one of the common symptoms encountered in daily practice and a pathology affecting the sphincter of Oddi (SO) as a cause, is never thought of at the first instance. Various disease states affecting the SO, mainly its dysfunction (SOD) seem to be important to be kept in mind while treating patients with intractable abdominal pain, especially postcholecystectomy cases. As the clinical syndrome of SOD is poorly defined and incompletely understood, an accurate estimate of the problem cannot be made. The most widely used pharmacologic test to determine SOD is the morphine-prostigmine provocative test of Nardi. In this article we have discussed the relevance of this test in modern day practice.

Key Words: Abdominal pain, sphincter of Oddi, dysfunction, bile duct, pancreas, surgery.

Abdominal pain is one of the commonest symptoms for which patients consult a doctor. There have been reports of patients undergoing a battery of investigations and multiple operations, with no relief of this symptom. Finally, when no cause is found many of these patients have been labeled as 'psychotics/depressed', and land up with a psychiatrist! It is true that complaints of recurrent abdominal pain do originate from emotional difficulties and there has been an indiscriminate use of antidepressants and antipsychotic drugs, only for the pain to recur and patient sent back to the previous physician (1). Disorders of SO motility are being increasingly recognized as a cause for post-cholecystectomy pain (2). Objective diagnosis of SOD is difficult because of the relative inaccessibility of the sphincter. In recent years, a number of investigations have been used in order to diagnose motility disorders of the SO. The most useful of these investigations is endoscopic manometry. However, in addition, the morphine neostigmine provocation (Nardi) test, radioscintigraphy to assess bile flow, and assessment of pancreatic duct diameter following secretin infusion has been used (3). Specificity and sensitivity for all of these investigations of SO function have been difficult to obtain due to the small number of patients and the heterogeneity of SO abnormalities.

Insight into rare causes of abdominal pain has shown that there are a good number of patients suffering from the so called SOD. This is a complex and poorly understood syndrome that usually manifests as pain of apparent biliary or pancreatic origin in the absence of an organic cause after conventional investigations. These patients have debilitating upper abdominal pain requiring regular strong analgesia and have a poor quality of life (4). It is with this background that a search for an effective diagnostic procedure was undertaken.

Diagnosis of SOD is challenging as the clinical symptoms usually do not correlate with the demonstrated abnormalities of SO motility. Specifically, the assessment of SO motor activity is limited to brief period and may not document the presence of a motor disorder that can be intermittent. There are principally two goals in the diagnosis of SOD. The first is to suggest the instrumental tools and the algorithm, if any, needed to achieve the diagnosis and the second is to carry out the instrumental, clinical or bio-humoral criteria that identify which patients should be treated pharmacologically or surgically.

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The only method that may directly detect SOD is SO manometry (5). However, it is invasive, difficult to perform and interpret, and is available in only a few specialized centers. A combination of scintigraphy and stimulation with morphine (0.04 mg/kg) was proposed to identify patients with a high SO pressure. When this parameter is high, it correlates with a good clinical response to sphincterotomy hence this test can be used to avoid SO manometry and its complications (3). But the Nardi test is still used in all leading centers worldwide as it is cheap, easy to perform and interpret, even at a junior level.

The Nardi test; also called the morphine-prostigmine provocation test is named after *George Nardi*, who first described it in 1966 (6). A fourfold increase in either serum amylase or lipase and reproduction of pain, after intramuscular injection of 10 mg morphine (to induce sphincteric spasm) and 1 mg prostigmine (to stimulate pancreatic exocrine secretions), is considered a positive test. The test is cheap and easy to perform but has a low sensitivity and specificity. It has been suggested that it may predict which patients will respond to sphincterotomy or septectomy (7).

Application and limitations of Nardi test; in the diagnostic workup of SOD, invasive investigations should be performed only in the presence of compelling clinical evidence and after non-invasive testing has yielded negative findings. Apart from diagnosis of SOD, Nardi test finds its place as a nonspecific method in diagnosing various conditions: Wirsungodyskinesia – an isolated dysfunction of the pancreatic duct sphincter was originally suggested on the basis of Nardi tests (8). Attempts have long been made to use the Nardi test for the selection of postcholecystectomy patients suffering from SO dyskinesia. To improve the diagnostic value of this method, visualization of SO spasms during morphine-prostigmine provocation by means of quantitative hepatobiliary scintigraphy (QHBS) has been done. QHBS combined with the Nardi test proved to be a useful non-invasive method for the detection of pathological sphincter spasms in patients with SO dyskinesia and hence the application of this method is therefore strongly recommended (9). However, it should be remembered that enzymatic changes may also occur in healthy subjects and in patients with irritable bowel syndrome, bringing the clinical utility of the test into question (10).

Recently, a combination of scintigraphy and stimulation with morphine (0.04 mg/kg) has been proposed to identify patients with a high SO pressure. When this parameter is high, it correlates with a good clinical response to sphincterotomy, and the authors have proposed this test to avoid SO manometry and its complications in these patients (11). The only reservation of the Nardi test is its low specificity which limits its use in clinical practice and makes it unsuitable as an objective diagnostic test for SOD.

In conclusion, motility disorder of the gall bladder and SO causes significant clinical symptoms but is unlikely to explain many instances of biliary pain. When noninvasive investigations and endoscopic retrograde cholangiopancreatography (ERCP) show no structural abnormality, manometry of both biliary and pancreatic sphincter may be considered. Nardi test hence plays an important role as a noninvasive technique in the diagnosis of SOD. There is a need for improving the precision and accuracy of this test. Once SOD is diagnosed, transduodenal sphinteroplasty and transampullary septectomy (TDS/TAS) is the therapeutic option in these patients.

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