

## Review Article

## Routine Screening before Endoscopic Procedures: A Systematic Review

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## ABSTRACT

Routine screening prior to endoscopic procedures includes ordering a panel of tests on all patients undergoing endoscopic procedures without seeking any history and physical examination of the patients. These laboratory testing increases the cost burden on the patient but can have a strong impact on complications after endoscopic procedures. Selective preoperative tests (i.e., tests ordered after consideration of careful history taking and physical examination) may assist in making decisions about the process of perioperative assessment and management. We believe that the Society of Gastrointestinal Endoscopy of India should take initiative to draw its own position paper / guideline in view of the strong impact on cost and medico-legal issue in an Indian setting.

**KEYWORDS:** Coagulation screening, endoscopic retrograde cholangiopancreatography endoscopic procedure, routine laboratory testing

## INTRODUCTION

Routine screening prior to endoscopic procedures includes ordering a panel of tests on all patients without seeking any history and physical examination of the patients. These laboratory testing increases cost burden on the patient but can have a strong impact on complications after endoscopic procedures. There is a medicolegal angle to the need of performing these tests. The percentage of unsuspected abnormalities in patients who undergo routine preoperative screening was found to be very low (0.2%–1.0%).<sup>[1,2]</sup> The British guidelines<sup>[3]</sup> and the American Society for Gastrointestinal Endoscopy (ASGE) guidelines<sup>[4]</sup> controversy on preprocedural coagulation profile have further increased confusion among the practicing gastroenterologists.

In view of paucity of data for routine laboratory testing before endoscopic procedures, most of the current guidelines and data have been extrapolated from studies on surgical and nonsurgical interventions.<sup>[4]</sup>

## COAGULATION TESTS

The prothrombin time (PT), the international normalized ratio (INR), and partial thromboplastin time do not predict or correspond with bleeding risk during or after

the procedure in patients who have no history or clinical evidence of bleeding disorder.<sup>[5-8]</sup>

ASGE guidelines have recommended against routine testing with coagulation studies before endoscopic procedures in patients without suggestion of abnormality in coagulation and indicated that these should be individualized based on patient and procedural risk factors.<sup>[4]</sup> The British guidelines 2008, later amended in 2016, have, however, recommended that patients undergoing biliary sphincterotomy for ductal stones should have a full blood count and INR/PT before their endoscopic retrograde cholangiopancreatography (ERCP)<sup>[1,9]</sup> [Table 1].

Previous groups have suggested that a platelet count of  $<80,000/\text{mm}^3$  and/or a PT  $>2$  s above the normal range should be considered as coagulopathy.<sup>[12]</sup> The 2006 British guidelines postulate that an INR of  $<1.2$  and a platelet count of  $>50,000/\text{mm}^3$  should be considered safe for a sphincterotomy.<sup>[13]</sup> However, the randomized trial conducted by Egan *et al.* demonstrated that none

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**Table 1: Recommendations of various association/authors**

Studies	Remarks
British, 2008 <sup>[9]</sup>	Patients undergoing BS for ductal stones should have a FBC and PT, INR performed no more than 72 h before the procedure
Chee <i>et al.</i> , 2008 <sup>[10]</sup>	Coagulation screening before any procedure in unselected patients to predict postoperative bleeding is not recommended
ASGE, 2014 <sup>[4]</sup>	Routine testing with coagulation studies before endoscopy procedures is not recommended in patients without suggestion of abnormality in coagulation
Egan <i>et al.</i> , 2014 <sup>[11]</sup>	Coagulation screening before ERCP should only be indicated in patients with high bilirubin levels or receiving anticoagulation therapy or individuals with a bleeding diathesis history
British, 2016 <sup>[3]</sup>	Patients undergoing BS for ductal stones should have a FBC and INR/PT performed before their ERCP

BS=Biliary sphincterotomy, FBC=Full blood count, PT=Prothrombin time, INR=International normalized ratio, ERCP=Endoscopic retrograde cholangiopancreatography

of the bleeding complications in the nonjaundiced group was associated with abnormal preprocedure coagulation screening. They also suggested that judicious use of coagulation screening before ERCP may lead to significant cost savings per patient.<sup>[11]</sup>

We hereby suggest that routine testing with coagulation studies before endoscopy procedures in healthy patients without suggestion of abnormality in coagulation should be avoided. Coagulation screening before ERCP should be advised for patients who have high bilirubin levels or patients receiving anticoagulation therapy.

### PLATELETS

The incidence of abnormalities in platelet counts before elective procedures in a study was found to be 0.9%.<sup>[14]</sup> Only 0.02% of all measurements of platelet count were abnormal and influenced the management.<sup>[14]</sup> For this reason, routine platelet counts before procedures should not be advised unless the history and physical examination findings suggest a high likelihood of thrombocytopenia or thrombocytosis. Patients who have a history of bleeding or easy bruising, known myeloproliferative disease, or who have been recently exposed to drugs known to cause thrombocytopenia should have a platelet count measured before the procedures.

### HEMOGLOBIN

Severe anemia is found in very less percentage of asymptomatic patients (<1%),<sup>[2]</sup> whereas mild anemia is relatively more common. Unsuspected severe anemia theoretically may predispose the patient to tissue hypoxia in the perioperative period if not corrected preoperatively. The baseline hemoglobin (Hb) level helps to predict the need for transfusion in patients undergoing procedures where significant blood loss is predicted.<sup>[15]</sup> Hb levels <8 g/dL have been associated with significant cardiac morbidity and operative death.<sup>[16]</sup>

If significant blood loss is not predicted during the procedure, patients should be investigated only if a history or physical examination is suggestive of severe anemia.<sup>[14]</sup> A medical history of profound fatigue, history of anemia, hematologic disorders, malignancy, advanced liver disease, renal insufficiency, or physical examination findings suggesting anemia (resting tachycardia or conjunctival pallor) should prompt a Hb determination even in patients who have to undergo minor procedures.

### SERUM CHEMISTRY TESTING

Serum electrolytes, serum glucose levels, and tests of renal function are usually included together as part of a “chemistry” panel. In asymptomatic or nonselected patients, abnormal sodium concentrations were found in 1.9% of patients,<sup>[17]</sup> abnormal potassium concentrations were noted in 0.2% of patients,<sup>[18]</sup> and abnormal glucose concentrations were found in 1.8% of patients.<sup>[18]</sup> Changes in clinical management were not reported in these patients.

Patients undergoing routine preoperative chemistry screening were found to have unsuspected abnormalities in 0.2%–1.0%.<sup>[2,19,20]</sup> These abnormalities neither changed the treatment nor did it lead to any adverse outcomes.<sup>[21,22]</sup> Clinical characteristics to consider before ordering these tests include likely endocrine disorders, the risk of renal and liver dysfunction, use of certain medications, and perioperative therapies.<sup>[23]</sup>

### CHEST RADIOGRAPHY

The chances of detecting incidental minor radiographic abnormalities are higher than most of the other preoperative tests.<sup>[24-26]</sup> However, these abnormalities seldom alter the patient care or clinical outcome.<sup>[24-26]</sup>

In a previous study, 10% of all preoperative chest radiographs were abnormal, but only 1.3% of films showed unexpected abnormalities, and in only 0.1% of patients were the findings of sufficient importance to change perioperative management.<sup>[24]</sup> This suggests that

**Table 2: Recommendations for laboratory testing**

Tests	The incidence of abnormalities that influence management <sup>[14]</sup>	Indications
Hemoglobin (%)	0.1	Anticipated major blood loss Symptoms of anemia Hematologic disorders Malignancy Advanced liver disease
Platelet count (%)	0.02	Renal insufficiency History of bleeding diathesis Myeloproliferative disorder
Coagulation tests (%)	0.0 - 0.1	Drugs causing thrombocytopenia History of bleeding diathesis Chronic liver disease Malnutrition The recent or long-term antibiotic use Patients with a raised bilirubin
Serum chemistry (%)	0.2 - 2.6	Anticoagulation therapy Endocrine disorders Renal and liver dysfunction Use of certain medications
Chest X-ray (%)	0.1 - 3.0	Perioperative therapies >60 years of age particularly those with a strong smoking history or recent respiratory infection
ECG (%)	2.6	New respiratory signs or symptoms or decompensated heart failure Comorbid illnesses particularly when symptomatic undergoing more complex or prolonged procedure

ECG=Electrocardiography

most abnormal films can be predicted based on clinical risk factors, and hence, a chest radiograph should not be recommended routinely before endoscopic procedures. A chest radiograph should be considered in elderly patients (>60 years) and especially in those with a strong history of smoking or recent respiratory infection.

### ELECTROCARDIOGRAPHY

Routine electrocardiography (ECG) before procedure helps to detect abnormalities that would increase the risk of postoperative cardiac complications or serve as a baseline in the event that a postoperative ECG is required. In view of the high incidence of abnormal ECG, the importance of screening ECG is limited. In a previous study, the incidence of any ECG abnormality was found to be 29.6%, but many of these abnormalities were not clinically significant and did not predict postoperative cardiac complications.<sup>[14]</sup> The risk of postoperative cardiac complications was found to be low even for patients with an abnormal ECG in the report by Turnbull and Buck.<sup>[27]</sup>

Age is one of the most important factors which helps to predict the likelihood of coronary artery disease and of an abnormal ECG. Patients with cardiovascular risk

factors are twice as likely to have an abnormal ECG as compared to those without risk factors.<sup>[28]</sup>

Patients without suggestive symptoms and normal physical examination findings undergoing a minor surgery and routine ECG can be avoided as it may not alter the outcome.<sup>[29]</sup> Similarly, the ASGE had recommended against routine ECG before endoscopic procedures in healthy patients.<sup>[4]</sup> An ECG should be obtained in patients with comorbid illnesses (e.g., heart disease, dysrhythmias, diabetes mellitus, hypertension, and electrolyte disturbances) undergoing surgery, particularly when symptomatic, and undergoing more complex or prolonged procedures.<sup>[2,14,30,31]</sup>

The recommendations for laboratory testing before routine endoscopy procedures have been summarized in Table 2 (Table adapted<sup>[14]</sup> and modified).

### CONCLUSION

Routine laboratory tests before endoscopic procedures do not have a significant contribution in the perioperative evaluation and management of the patient. Selective preoperative tests (i.e., tests ordered after consideration

of careful history taking and physical examination) may assist in making decisions about the process of perioperative assessment and management.

The cost of screening and follow-up testing to assess even minor abnormalities that rarely improve the patient outcome should be taken into consideration. Even when the tests results are falsely abnormal, it may delay the endoscopic procedures for no reason and subject the patient to additional health risks.

We believe that the Society of Gastrointestinal Endoscopy of India should take initiative to draw its own position paper/guideline in view of the strong impact on cost and medicolegal issue in an Indian setting.

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### Conflicts of interest

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