Published online: 2019-09-24

Review Article

Routine Screening before Endoscopic Procedures: A Systematic Review

Gajanan Ashokrao Rodge, Mahesh Kumar Goenka

Institute of Gastrosciences and Liver, Apollo Gleneagles Hospital, Kolkata, West Bengal, India

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%).[1,2] The British guidelines[3] and the American Society for Gastrointestinal Endoscopy (ASGE) guidelines[4] 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.[4]

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.[5-8]

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.[4] 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)[1,9] [Table 1].

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

Access this article online

Quick Response Code:

Website: www.jdeonline.in

DOI: 10.4103/jde.JDE_77_18

Address for correspondence: Dr. Mahesh Kumar Goenka, Institute of Gastrosciences and Liver, Apollo Gleneagles Hospital, Kolkata, West Bengal, India.
E-mail: mkgkolkata@gmail.com

How to cite this article: Rodge GA, Goenka MK. Routine screening before endoscopic procedures: A systematic review. J Dig Endosc 2018;9:145-8.

Table 1: Recommendations of various association/authors

Studies	Remarks
British, 2008[9]	Patients undergoing BS for ductal stones should have a FBC and PT, INR performed no more than 72 h before the procedure
Chee *et al*., 2008[10]	Coagulation screening before any procedure in unselected patients to predict postoperative bleeding is not recommended
ASGE, 2014[4]	Routine testing with coagulation studies before endoscopy procedures is not recommended in patients without suggestion of abnormality in coagulation
Egan *et al*., 2014[11]	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[3]	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 judicial use of coagulation screening before ERCP may lead to significant cost savings per patient.[11]

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%.[14] Only 0.02% of all measurements of platelet count were abnormal and influenced the management.[14] 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%),[2] 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.[15] Hb levels <8 g/dL have been associated with significant cardiac morbidity and operative death.[16]

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.[14] 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;[17] abnormal potassium concentrations were noted in 0.2% of patients,[18] and abnormal glucose concentrations were found in 1.8% of patients.[18] 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%.[2,19,20] These abnormalities neither changed the treatment nor did it lead to any adverse outcomes.[21,22] 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.[23]

Chest Radiography

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

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.[24] This suggests that

Table 2: Recommendations for laboratory testing

Tests	The incidence of abnormalities that influence management[14]	Indications
Hemoglobin (%)	0.1	Anticipated major blood loss
		Symptoms of anemia
		Hematologic disorders
		Malignancy
		Advanced liver disease
		Renal insufficiency
Platelet count (%)	0.02	History of bleeding diathesis
		Myeloproliferative disorder
		Drugs causing thrombocytopenia
Coagulation tests (%)	0.0 - 0.1	History of bleeding diathesis
		Chronic liver disease
		Malnutrition
		The recent or long-term antibiotic use
		Patients with a raised bilirubin
		Anticoagulation therapy
Serum chemistry (%)	0.2 - 2.6	Endocrine disorders
		Renal and liver dysfunction
		Use of certain medications
		Perioperative therapies
Chest X-ray (%)	0.1 - 3.0	>60 years of age particularly those with a strong smoking history or recent respiratory infection
		New respiratory signs or symptoms or decompensated heart failure
ECG (%)	2.6	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.[14] 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.[27]

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.[28]

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.[29] Similarly, the ASGE had recommended against routine ECG before endoscopic procedures in healthy patients.[4] 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.[2,14,30,31]

The recommendations for laboratory testing before routine endoscopy procedures have been summarized in Table 2 (Table adapted[14] 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.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Kumar A, Srivastava U. Role of routine laboratory investigations in preoperative evaluation. J Anaesthesiol Clin Pharmacol 2011;27:174-9.
2. Kaplan EB, Sheiner LB, Boeckmann AJ, Roizen MF, Beal SL, Cohen SN, *et al.* The usefulness of preoperative laboratory screening. JAMA 1985;253:3576-81.
3. Williams E, Beckingham I, El Sayed G, Gurusamy K, Sturgess R, Webster G, *et al.* Updated guideline on the management of common bile duct stones (CBDS). Gut 2017;66:765-82.
4. ASGE Standards of Practice Committee, Pasha SF, Acosta R, Chandrasekhara V, Chathadi KV, Eloubeidi MA, *et al.* Routine laboratory testing before endoscopic procedures. Gastrointest Endosc 2014;80:28-33.
5. Dzik WH. Predicting hemorrhage using preoperative coagulation screening assays. Curr Hematol Rep 2004;3:324-30.
6. Eika C, Havig O, Godal HC. The value of preoperative haemostatic screening. Scand J Haematol 1978;21:349-54.
7. Segal JB, Dzik WH; Transfusion Medicine/Hemostasis Clinical Trials Network. Paucity of studies to support that abnormal coagulation test results predict bleeding in the setting of invasive procedures: An evidence-based review. Transfusion 2005;45:1413-25.
8. Suchman AL, Mushlin AI. How well does the activated partial thromboplastin time predict postoperative hemorrhage? JAMA 1986;256:750-3.
9. Williams EJ, Green J, Beckingham I, Parks R, Martin D, Lombard M, *et al.* Guidelines on the management of common bile duct stones (CBDS). Gut 2008;57:1004-21.
10. Chee YL, Crawford JC, Watson HG, Greaves M. Guidelines on the assessment of bleeding risk prior to surgery or invasive procedures. British Committee for Standards in Haematology. Br J Haematol 2008;140:496-504.
11. Egan RJ, Nicholls J, Walker S, Mellor K, Young WT, Stechman MJ, *et al.* Routine coagulation screening is an unnecessary step prior to ERCP in patients without biochemical evidence of jaundice: A cross-centre study. Int J Surg 2014;12:1216-20.
12. Freeman ML, Nelson DB, Sherman S, Haber GB, Herman ME, Dorsher PJ, *et al.* Complications of endoscopic biliary sphincterotomy. N Engl J Med 1996;335:909-19.
13. Chapman RW. Complications of ERCP. In: Green J, editor. Guidelines on Complications of Gastrointestinal Endoscopy. London: British Society of Gastroenterology; 2006. p. 20-5.
14. Smetana GW, Macpherson DS. The case against routine preoperative laboratory testing. Med Clin North Am 2003;87:7-40.
15. Faris PM, Spence RK, Larholt KM, Sampson AR, Frei D. The predictive power of baseline hemoglobin for transfusion risk in surgery patients. Orthopedics 1999;22:s135-40.
16. Carson JL, Poses RM, Spence RK, Bonavita G. Severity of anaemia and operative mortality and morbidity. Lancet 1988;1:727-9.
17. Dzankic S, Pastor D, Gonzalez C, Leung JM. The prevalence and predictive value of abnormal preoperative laboratory tests in elderly surgical patients. Anesth Analg 2001;93:301-8.
18. Narr BJ, Hansen TR, Warner MA. Preoperative laboratory screening in healthy mayo patients: Cost-effective elimination of tests and unchanged outcomes. Mayo Clin Proc 1991;66:155-9.
19. Blery C, Charpak Y, Szatan M, Darne B, Fourgeaux B, Chastang C, *et al.* Evaluation of a protocol for selective ordering of preoperative tests. Lancet 1986;1:139-41.
20. McKee RF, Scott EM. The value of routine preoperative investigations. Ann R Coll Surg Engl 1987;69:160-2.
21. Haug RH, Reifeis RL. A prospective evaluation of the value of preoperative laboratory testing for office anesthesia and sedation. J Oral Maxillofac Surg 1999;57:16-20.
22. Perez A, Planell J, Bacardaz C, Hounie A, Franci J, Brotons C, *et al.* Value of routine preoperative tests: A multicentre study in four general hospitals. Br J Anaesth 1995;74:250-6.
23. Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, Nickinovich DG, American Society of Anesthesiologists Task Force on Preanesthesia Evaluation, Pasternak LR. Practice advisory for preanesthesia evaluation: An updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology 2012;116:522-38.
24. Archer C, Levy AR, McGregor M. Value of routine preoperative chest x-rays: A meta-analysis. Can J Anaesth 1993;40:1022-7.
25. Lim EH, Liu EH. The usefulness of routine preoperative chest X-rays and ECGs: A prospective audit. Singapore Med J 2003;44:340-3.
26. Silvestri L, Maffessanti M, Gregori D, Berlot G, Gullo A. Usefulness of routine pre-operative chest radiography for anaesthetic management: A prospective multicentre pilot study. Eur J Anaesthesiol 1999;16:749-60.
27. Turnbull JM, Buck C. The value of preoperative screening investigations in otherwise healthy individuals. Arch Intern Med 1987;147:1101-5.
28. Tait AR, Parr HG, Tremper KK. Evaluation of the efficacy of routine preoperative electrocardiograms. J Cardiothorac Vasc Anesth 1997;11:752-5.
29. Laine C, Williams SV, Wilson JF. In the clinic. Preoperative evaluation. Ann Intern Med 2009;151:ITC1-15.
30. Pasternak LR. Preoperative laboratory testing: General issues and considerations. Anesthesiol Clin North America 2004;22:13-25.
31. American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Practice advisory for preanesthesia evaluation: A report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology 2002;96:485-96.