Jaundice

Jaundice - What it is

Jaundice is yellow discoloration of tissues due to accumulation of bilirubin. Normal serum bilirubin ranges from 7-32 mmol/L but jaundice may not be detected clinically until the level exceeds 40mmol/L. Various mechanisms can contribute to jaundice, such as excess bilirubin production, impaired intrahepatic conjugation and secretion, or obstruction in bile flow.

Causes of jaundice include hepatitis.

Jaundice - Symptoms

Symptoms may not be specific. A history of hepatitis, drug intake, injection, alcohol intake, sexual contact, and ingestion of raw shellfish and wild mushrooms are some of the causes. In addition to yellow discoloration of skin and sclera, patient may present with upper abdominal pain or discomfort, fever, weight loss, loss of appetite, nausea and vomiting, tea-colored urine, clay-colored stool or skin itchiness.

Jaundice - Causes and Risk Factors

Causes of Jaundice

Medical

- Haemolysis

  Examples of haemolysis include sickle cell disease, spherocytosis, thalassaemia, where the pathological breakdown of red blood cells results in excessive bilirubin production.

- Hepatitis: Acute and Chronic

  Acute hepatocellular inflammation can be due to a variety of causes, the most common etiology is due to virus. Majority of acute inflammation is self limiting without long term sequelae. Some form of hepatitis such as hepatitis B and C, can lead to chronic carrier state, which may maintain normal liver function or progress to chronic liver disease or liver cirrhosis. Other common causes of acute hepatitis are drugs and alcohol abuse.

- Drug induced liver damage

  A wide spectrum of drugs may cause liver damage. Usually they are dose dependent or due to prolonged therapy and most are reversible once the insulting medication is discontinued. Examples are paracetamol, anabolic steroids, isoniazid and cytotoxic medication such as methotrexate. However, some may progress to hepatic fibrosis or fulminant liver failure.

- Liver failure: Acute and Chronic

  Acute liver failure denotes massive hepatocellular necrosis in a previously normal liver resulting in altered mentation and coagulopathy. It carries high mortality. Chronic liver failure arises from a background of liver cirrhosis and is associated with portal hypertension, ascites, splenomegaly and gastrooesophageal varices.

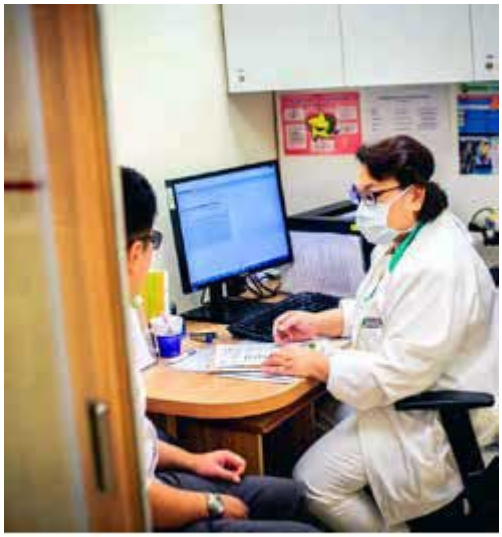
- Cirrhosis

  A chronic disease of the liver marked by degeneration of cells, inflammation and fibrous thickening of tissue. Liver cirrhosis can be categorized according to its aetiology, such as

posthepatitic (after hepatitis B or C), alcoholic and primary biliary cirrhosis, and cryptogenic if the cause is unknown.

Surgical (Cholestatic or Obstructive)

- **Ductal stones**
  This is the most common cause of obstructive jaundice. Most of the ductal stones are secondary to stone migration from gall bladder. Primary ductal stones are less common and are usually associated with bile duct/ sphincter complex dysfunction.



Surgery may be required for gallstones or ductal stone disease.

- **Pancreatic or biliary malignancy**
  Head of pancreas cancer, periampullary tumour and cholangiocarcinoma of the bile duct can cause biliary obstruction. Patients usually present with progressive worsening of painless jaundice or severe jaundice with or without constitutional symptoms. Some may present with sepsis due to ascending cholangitis. Patient with periampullary tumour may be associated with anaemia or upper gastrointestinal bleeding.
- **Benign bile duct stricture**
  Most of the benign bile duct strictures are due to bile duct injury during cholecystectomy or rarely instrumentational injury such as during endoscopic retrograde cholangiopancreatography. Bile duct stricture can also arise from chronic pancreatitis and sclerosing cholangitis.
- **External compression of bile duct**
  By tumour masses arises from liver, gallbladder, retroperitoneum or lymph nodes
- **Parasitic infestations**
  In addition to malignant bile duct obstruction due to biliary or pancreatic cancer, jaundice may also occur in association with extensive liver malignancy, either primary or secondary.

Jaundice - Diagnosis

Initial investigations aim to establish the diagnosis of hyperbilirubinaemia and to differentiate whether the jaundice is prehepatic, hepatocellular or cholestatic.

The following tests may be performed:

- Laboratory Test
  - Liver function test
  - FBC/Peripheral blood film
  - Urine for urobilinogen (haemolytic) or bilirubin (cholestatic)
  - Reticulocyte count

- Serology for viral hepatitis
- PT/APTT

- Imaging (Non invasive)
  - Ultrasound hepato-biliary system
    Ultrasound is the primary imaging modality of choice in investigating hepatobiliary system, especially in surgical jaundice patient with suspected gallstone disease. It is less expensive and doesn't involve radiation. Contrast enhanced ultrasound can further differentiate liver lesions. However it is operator dependent and certain anatomical location may make evalution difficult, such as distal CBD and pancreas.
  - Computerised Tomography (CT) Scan
    Contrast enhanced spiral CT is the gold standard for evaluation of space occupying lesion in hepato-pancreatico-biliary system. It is essential in all patients with suspected tumours, not only for diagnostic and staging purpose, also for presurgical planning. However, it involves radiation and small risk of contrast induced nephropathy.
  - Magnetic resonance cholangiopancreatography (MRCP)/Magnetic resonance imaging (MRI)
    MRI may provide better definition as compared to CT scan and may not require contrast. MRCP can better delineate the biliary and pancreatic ductal system. It is relatively more expensive than CT scan.

- Invasive procedure- diagnostic and therapeutic
  - Endoscopic retrograde cholangiopancreatography (ERCP)
    ERCP is performed under sedation but its diagnostic role in patient with obstructive jaundice is gradually replaced by MRCP which is non invasive and not operator dependent. However, its therapeutic advantage in ductal stone removal or stent insertion in treating obstructive jaundice due to ductal stricture or malignant compression can not be over emphasized. It can also provide direct visualization of periampullary tumour and tissue biopsy, as well as ductal brushing cytology.
  - Percutaneous transhepatic cholangiography (PTC)
    Its advantage lies in assessing obstructing lesion at or proximal to portal hilum in which ERCP is technically not feasible. Besides diagnostic cholangiography and brushing cytology, as in ERCP, it can be used to insert stent through proximal obstructive lesion.
  - Endoscopic ultrasonography (EUS)
    It is extremely useful for the diagnosis and staging of bile duct and pancreatic

pathology. Performed endoscopically, EUS can be used to obtain guided trucut biopsy of suspected ductal, pancreatic lesions as well as adjacent lymph nodes, unlike ERCP which can only provide endothelial cytology.

Jaundice - Treatments

Treatment of jaundice is tailored to identifying and treating the underlying cause. For medical jaundice, the treatment is generally supportive and avoidance of further liver insult. Acute liver failure carries high mortality rate and may require liver transplant if supportive measure failed.

Patients presenting with obstructive jaundice and sepsis requires close monitoring and antibiotic treatment. Biliary decompression via percutaneous transhepatic biliary drainage (PTBD) or endoscopic drainage may be required urgently for sepsis control. Emergency surgery is rarely required in acute setting. Subsequently surgery maybe planned for gallstones/ ductal stone disease in the form of cholecystectomy, laparoscopic or open, with or without CBD exploration.

Definitive surgery, curative or palliative bypass maybe be arranged for suitable candidate with underlying malignancy after proper evaluation and study.

In general, jaundice is a hallmark of underlying syndrome that requires collative management in multidisciplinary approach.

Tags: Gastroenterology & Hepatology
Article contributed by Centre for Digestive and Liver Diseases (CDLD), Singapore General Hospital