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JAUNDICE -REVIEW OF CLINICAL FEATURES, DIFFERENTIAL DIAGNOSIS AND REMEDIES

K.P.Sampath Kumar*[1], Debjit Bhowmik[2]

Affiliated to:

1. Department of Pharmaceutical sciences, Coimbatore medical college, Coimbatore
2. Karpagam University, Coimbatore

For Email Click Here

ABSTRACT

Jaundice is not a disease but rather a sign that can occur in many different diseases. Jaundice can occur in babies, children, and adults. Jaundice is not an illness, but a medical condition in which too much bilirubin a compound produced by the breakdown of hemoglobin from red blood cells is circulating in the blood. The excess bilirubin causes the skin, eyes, and the mucus membranes in the mouth to turn a yellowish color. Jaundice is common in newborn babies and will usually clear up without treatment. However, for adults the symptoms of jaundice may indicate damage to the liver. If the cause is not treated, it can lead to liver failure.Jaundice is a condition in which yellow discoloration of the skin and mucous membranes occur due to an increase in the bile pigments, namely, bilirubin in the blood. In many cases, yellowness in the white part of the eyes is more obvious than in the skin. Bilirubin is a by-product of the daily natural breakdown and destruction of red blood cells in the body. The hemoglobin molecule that is released into the blood by this process is split, with the heme portion undergoing a chemical conversion to bilirubin. Normally, the liver metabolizes and excretes the bilirubin in the form of bile. However, if there is a disruption in this normal metabolism and/or production of bilirubin, jaundice may result. Since jaundice is a symptom, not a specific disorder, treatment for it depends on its cause. This can range from the removal of gallstones or tumors to antibiotics to treat infections, to liver transplant in cases where the liver is severely damaged. However, for conditions like cirrhosis and chronic hepatitis, which are lifelong problems, jaundice may be permanent or recurring.

Keywords: jaundice

INTRODUCTION

Jaundice is a yellowing of the skin, whites of the eyes, and body fluids. It is caused by an increase in the amount of bilirubin in the blood. Bilirubin is a yellowish pigment that is produced from the breakdown of heme, primarily from hemoglobin and red blood cells (RBCs). Bilirubin is transported by the blood to the liver, where the liver processes it, allowing it to be excreted in bile. Bile is a thick, yellow-green-brown fluid

that is secreted into the upper small intestine (duodenum) to get rid of waste products (such as bilirubin and excess cholesterol) and to aid in the digestion of fats. Jaundice may arise from increased breakdown of red blood cells, inherited changes in bilirubin metabolism, liver disease or damage, and whenever there is interference with bile excretion. Normally, about 1% of our red blood cells retire every day, to be replaced by fresh red blood cells. The old ones are processed in the liver and disposed of. Much of the resulting bilirubin leaves the body in the stool.If there are too many red blood cells retiring for the liver to handle, yellow pigment builds up in the body. When there is enough to be visible, jaundice results.Jaundice can be caused by too many red blood cells retiring, by the liver being overloaded or damaged, or by the inability to move processed bilirubin from the liver through the biliary tract to the gut.Most babies have some jaundice during the first week of life. The ordeal of birth can send many red blood cells to an early retirement (especially if a vacuum is used!), and babies' livers are often unprepared for the load. Before mom' s milk comes in and stooling begins in earnest, bilirubin accumulates more easily. Jaundice is even more common in premature babies.Physiologic jaundice is the name for normal jaundice commonly seen in healthy babies.Pathologic jaundice is the name given when jaundice presents a health risk, either because of its degree or its cause. Pathologic jaundice can occur in children or adults. It arises for many reasons, including blood incompatibilities, blood diseases, genetic syndromes, hepatitis, cirrhosis, bile duct blockage, other liver diseases, infections, or medications. The term also applies to physiologic jaundice exaggerated by dehydration, prematurity, difficult delivery, or other reason.Another condition called Gilbert syndrome is a benign, hereditary condition in which mild jaundice develops. It is caused by low levels of some bilirubin-processing enzymes in the liver. This condition, once recognized, requires no further treatment or evaluation. There are other more rare hereditary causes of elevated bilirubin levels.A yellow to orange color may be imparted to the skin by consuming too much beta carotene, the orange pigment seen in carrots. In this condition, the whites of the eyes remain white, while people with true jaundice often have a yellowish tinge to the eyes. In order to understand jaundice, it is useful to know about the role of the liver in producing bile. The most important function of the liver is the processing of chemical waste products like cholesterol and excreting them into the intestines as bile. The liver is the premier chemical factory in the body—most incoming and outgoing chemicals pass through it. It is the first stop for all nutrients, toxins, and drugs absorbed by the digestive tract. The liver also collects chemicals from the blood for processing. Many of these outward-bound chemicals are excreted into the bile. One particular substance, bilirubin, is yellow. Bilirubin is a product of the breakdown of hemoglobin, which is the protein inside red blood cells. If bilirubin cannot leave the body, it accumulates and discolors other tissues. The normal total level of bilirubin in blood serum is between 0.2 mg/dL and 1.2 mg/dL. When it rises to 3 mg/dL or higher, the person's skin and the whites of the eyes become noticeably yellow.

SYMPTOMS OF JAUNDICE

Following are the major jaundice symptoms:

1. Extreme weakness
2. Headache and fever
3. Loss of appetite
4. Severe constipation
5. Nausea
6. Yellow discoloration of the eyes, tongue, skin and urine
7. Dull pain in the liver region

TYPES OF JAUNDICE

Neonatal jaundice

Jaundice is common in newborn babies. It occurs as a result of the liver being underdeveloped and not fully functional. In most cases, neonatal jaundice is nothing to worry about. It requires no treatment and usually disappears after a week.

Jaundice in adults and older children

Jaundice that occurs in adults and older children is usually a sign of an underlying health problem. There are three types of jaundice.

Hepatocellular jaundice

Hepatocellular jaundice is the most common type of jaundice. It occurs when bilirubin is unable to leave the liver cells and cannot be removed from the body by the kidneys. Hepatocellular jaundice is usually caused by liver failure, liver disease (cirrhosis), hepatitis (inflammation of the liver) or by taking certain types of medication.

Haemolytic jaundice

Haemolytic jaundice is when too much bilirubin is produced as a result of a large number of red blood cells being broken down. This can be due to a number of conditions, such as anaemia or a problem with the metabolism (the way that the body produces and uses energy).

Obstructive jaundice

Obstructive jaundice occurs when there is an obstruction (blockage) in the bile duct, which prevents bilirubin from leaving the liver. This type of jaundice is usually caused by a gallstone, a tumour or a cyst in the bile duct or pancreas

CAUSES OF JAUNDICE

Increased production of bilirubin

There are several uncommon conditions that give rise to over-production of bilirubin. The bilirubin in the blood in these conditions usually is only mildly elevated, and the resultant jaundice usually is mild and difficult to detect. These conditions include: 1) rapid destruction of red blood cells (referred to as hemolysis), 2) a defect in the formation of red blood cells that leads to the over-production of hemoglobin in the bone marrow (called ineffective erythropoiesis), or 3) absorption of large amounts of hemoglobin when there has been much bleeding into tissues (e.g., from hematomas, collections of blood in the tissues).

Acute inflammation of the liver

Any condition in which the liver becomes inflamed can reduce the ability of the liver to conjugate (attach glucuronic acid to) and secrete bilirubin. Common examples include acute viral hepatitis, alcoholic hepatitis, and Tylenol-induced liver toxicity.

Chronic liver diseases

Chronic inflammation of the liver can lead to scarring and cirrhosis, and can ultimately result in jaundice. Common examples include chronic hepatitis B and C, alcoholic liver disease with cirrhosis, and autoimmune hepatitis.

Infiltrative diseases of the liver

Infiltrative diseases of the liver refer to diseases in which the liver is filled with cells or substances that don't belong there. The most common example would be metastaticcancer to the liver, usually from cancers within the abdomen. Uncommon causes include a few diseases in which substances accumulate within the liver cells, for example, iron (hemochromatosis), alpha-one antitrypsin (alpha-one antitrypsin deficiency), and copper (Wilson's disease).

Inflammation of the bile ducts

Diseases causing inflammation of the bile ducts, for example, primary biliary cirrhosis orsclerosing cholangitis and some drugs, can stop the flow of bile and elimination of bilirubin and lead to jaundice.

Blockage of the bile ducts

The most common causes of blockage of the bile ducts are gallstones and pancreatic cancer. Less common causes include cancers of the liver and bile ducts.

Drugs

Many drugs can cause jaundice and/or cholestasis. Some drugs can cause liver inflammation (hepatitis) similar to viral hepatitis. Other drugs can cause inflammation of the bile ducts, resulting in cholestasis and/or jaundice. Drugs also may interfere directly with the chemical processes within the cells of the liver and bile ducts that are responsible for the formation and secretion of bile to the intestine. As a result, the constituents of bile, including bilirubin, are retained in the body. The best example of a drug that causes this latter type of cholestasis and jaundice is estrogen. The primary treatment for jaundice caused by drugs is discontinuation of the drug. Almost always the bilirubin levels will return to normal within a few weeks, though in a few cases it may take several months.

Genetic disorders

There are several rare genetic disorders present from birth that give rise to jaundice. Crigler-Najjar syndrome is caused by a defect in the conjugation of bilirubin in the liver due to a reduction or absence of the enzyme responsible for conjugating the glucuronic acid to bilirubin. Dubin-Johnson and Rotor's syndromes are caused by abnormal secretion of bilirubin into bile.

The only common genetic disorder that may cause jaundice is Gilbert's syndrome which affects approximately 7% of the population. Gilbert's syndrome is caused by a mild reduction in the activity of the enzyme responsible for conjugating the glucuronic acid to bilirubin. The increase in bilirubin in the blood usually is mild and infrequently reaches levels that cause jaundice. Gilbert's syndrome is a benign condition that does not cause health problems.

Developmental abnormalities of bile ducts

There are rare instances in which the bile ducts do not develop normally and the flow of bile is interrupted. Jaundice frequently occurs. These diseases usually are present from birth though some of them may first be recognized in childhood or even adulthood. Cysts of the bile duct (choledochal cysts) are an example of such a developmental abnormality. Another example is Caroli's disease.

Jaundice of pregnancy

Most of the diseases discussed previously can affect women during pregnancy, but there are some additional causes of jaundice that are unique to pregnancy.

Cholestasis of pregnancy

Cholestasis of pregnancy is an uncommon condition that occurs in pregnant women during the third trimester. The cholestasis is often accompanied by itching but infrequently causes jaundice. The itching can be severe, but there is treatment (ursodeoxycholic acid or ursodiol). Pregnant women with cholestasis usually do well although they may be at greater risk for developing gallstones. More importantly, there appears to be an increased risk to the fetus for developmental abnormalities. Cholestasis of pregnancy is more common in certain groups, particularly in Scandinavia and Chile, and tends to occur with each additional pregnancy. There also is an

association between cholestasis of pregnancy and cholestasis caused by oralestrogens, and it has been hypothesized that it is the increased estrogens during pregnancy that are responsible for the cholestasis of pregnancy.

Pre-eclampsia

Pre-eclampsia, previously called toxemia of pregnancy, is a disease that occurs during the second half of pregnancy and involves several systems within the body, including the liver. It may result in high blood pressure, fluid retention, and damage to the kidneys as well as anemia and reduced numbers of platelets due to destruction of red blood cells and platelets. It often causes problems for the fetus. Although the bilirubin level in the blood is elevated in pre-eclampsia, it usually is mildly elevated, and jaundice is uncommon. Treatment of pre-eclampsia usually involves delivery of the fetus as soon as possible if the fetus is mature.

Acute fatty liver of pregnancy

Acute fatty liver of pregnancy (AFLP) is a very serious complication of pregnancy of unclear cause that often is associated with pre-eclampsia. It occurs late in pregnancy and results in failure of the liver. It can almost always be reversed by immediate delivery of the fetus. There is an increased risk of infant death. Jaundice is common, but not always present in AFLP. Treatment usually involves delivery of the fetus as soon as possible.

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Many tests are available for determining the cause of jaundice, but the history and physical examination are important as well.

EXAMS AND TESTS

The health care pracitioner will need to take a detailed history of the patient's illness, and he or she will also be examined to see if there are any findings that indicate the cause of the patient's jaundice. However, additional testing is usually required to clearly determine the underlying cause of jaundice. The following tests and imaging studies may be obtained:

Blood tests

These may initially include a complete blood count (CBC), liver function tests (including a bilirubin level), lipase/amylase level to detect inflammation of the pancreas (pancreatitis), and an electrolytes panel. In women, a pregnancy test may be obtained. Additional blood tests may be required depending upon the initial results and the history provided to the practitioner.

Urinalysis: Urinalysis is an analysis of the urine and is a very useful test in the diagnosis of screening many diseases.

Imaging Studies

- **Ultrasound:** This is a safe, painless imaging study that uses sound waves to examine the liver, gallbladder, and pancreas. It is very useful for detecting gallstones and dilated bile ducts. It can also detect abnormalities of the liver and the pancreas.
- **Computerized tomography (CT) scan:** A CT scan is imaging study similar to an X-ray that provides more details of all the abdominal organs. Though not as good as ultrasound at detecting gallstones, it can identify various other abnormalities of the liver, pancreas, and other abdominal organs as well.
- **Cholescintigraphy (HIDA scan)**: A HIDA scan is an imaging study that uses a radioactive substance to evaluate the gallbladder and the bile ducts.
- **Magnetic resonance imaging (MRI):** MRI is an imaging study that uses a magnetic field to examine the organs of the abdomen. It can be useful for detailed imaging of the bile ducts.
- **Endoscopic retrograde cholangiopancreatography (ERCP):** ERCP is a procedure that involves the introduction of an endoscope (a tube with a camera at the end) through the mouth and into the small intestine. A dye is then injected

into the bile ducts while X-rays are taken. It can be useful for identifying stones, tumors, or narrowing of the bile ducts.

Liver Biopsy

- In this procedure, a needle is inserted into the liver after a local anesthetic has been administered. Often ultrasound will be used to guide placement of the needle. The small sample of liver tissue which is obtained is sent to a laboratory for examination by a pathologist (a physician who specializes in diagnosis of tissue samples). Among other things, a liver biopsy can be useful for diagnosing inflammation of the liver, cirrhosis, and cancer.

Jaundice Treatment

Treatment depends on the cause of the underlying condition leading to jaundice and any potential complications related to it. Once a diagnosis is made, treatment can then be directed to address that particular condition, and it may or may not require hospitalization.

- Treatment may consist of expectant management (watchful waiting) at home with rest.
- Medical treatment with intravenous fluids, medications, antibiotics, or blood transfusions may be required.
- If a drug/toxin is the cause, these must be discontinued.
- In certain cases of newborn jaundice, exposing the baby to special colored lights (phototherapy) or exchange blood transfusions may be required to decrease elevated bilirubin levels.
- Surgical treatment may be required.

Medical Treatment

Treatment varies based on the medical condition responsible for causing jaundice, and the associated symptoms and complications. Treatments may include the following:

- supportive care,
- IV fluids in cases of dehydration,
- medications for nausea/vomiting and pain,
- antibiotics,
- antiviral medications,
- blood transfusions,
- steroids,
- chemotherapy/radiation therapy, and
- phototherapy (newborns).

Medications

Medications may or may not be necessary. After diagnosing the cause of the patient's jaundice, the health care practitioner will direct the patient's treatment and prescribe medications if they are necessary. As outlined above, various medication options exist depending on the underlying cause of the jaundice.

Surgery

Surgical treatment may be necessary in certain cases of cancer, congenital malformations, conditions that obstruct the bile ducts,gallstones, and abnormalities of the spleen. Sometimes, a liver transplant may be necessary.

Jaundice causes your skin and the whites of your eyes to turn yellow. Too much bilirubin causes jaundice. Bilirubin is a yellow chemical in hemoglobin, the substance that carries oxygen in your red blood cells. As red blood cells break down, your body builds new cells to replace them. The old ones are processed by the liver. If the liver cannot handle the blood cells as they break down, bilirubin builds up in the body and your skin may look yellow.

Many healthy babies have some jaundice during the first week of life. It usually goes away. However, jaundice can happen at any age and may be a sign of a problem. Jaundice can happen for many reasons, such as:

- Blood diseases
- Genetic syndromes

- Liver diseases, such as hepatitis or cirrhosis
- Blockage of bile ducts
- Infections
- Medicines

HOME REMEDY FOR JAUNDICE

- ❖ Extract the juice of bitter luffa by pounding and squeezing through a cloth. Take the juice on the palm and slowly sniff it. The juice should be drawn through the nostrils.
- ❖ The green leaves of the radish are also an effective home remedy. Pound the leaves and extract the juice from them. Intake at least one pound of this juice daily.
- ❖ Another effective remedy would be to mash a banana and add to it a tablespoon of honey. Have this mixture two times a day.
- ❖ In a glass of buttermilk, mix a pinch of black pepper. Intake this for about a week.
- ❖ Take 4 grams of Indian gooseberry with a glass of water. Have this thrice a day for about 20 days.
- ❖ In a cup of boiling water, add 8-10 lemon leaves. Cover it with a lid for about 5 minutes. Now, strain the liquid and drink it. Repeat this for 4-5 days.
- ❖ Take a cup of water and boil it. To this, add 2 teaspoons of oregano and leave it for 10 minutes. Filter the solution and have it.
- ❖ In a glass of buttermilk, add a pinch of roasted alum. Have this 2-3 times a day, regularly.
- ❖ Mix 1/4 tsp of turmeric powder in a glass of hot water. Have this 2 to 3 times a day.
- ❖ Take tender papaya leaves and make a paste out of it. Consume ½ tsp of this paste with 1 tsp honey.
- ❖ Consuming lots of lime juice is beneficial for a person suffering from jaundice.
- ❖ Mix 1/2 tsp ginger juice and 1 tsp each of mint juice and lime juice. have this mixture after a span of few hours.
- ❖ Have a glass of tomato juice early in the morning. Add some salt and pepper to it, before drinking.
- ❖ Squeeze half a lemon in half a cup of beetroot juice. This is an effective remedy for treating jaundice.
- ❖ Consuming a glass of carrot juice every day is also beneficial in curing carrot juice.
- ❖ Avoid having oils, fried foods, butter, turmeric, spicy food, pickles and sour products.

HERBAL REMEDIES FOR JAUNDICE

Following are some of the effective herbal remedies for jaundice:

- Jaundice berry is a useful herb for all kinds of liver ailments, especially jaundice. It is a bitter tonic which must be given to a jaundice patient several times a day in does of quarter teaspoons.

- Indian aloe is also used in liver problems such as jaundice. For good results, the pulp of one of its leaves is to be taken with black salt and ginger every morning for a period of ten days.

- Indian Sorrel is also beneficial in treatment of jaundice. It is taken with buttermilk that is prepared from cow's milk.

- Another useful herbal remedy for treating jaundice is chicory plant. All parts of the chicory plant is useful in the treatment of liver ailments. The flowers, seeds and roots are the most often used. The juice of the chicory can help in the treatment of sluggishness of the liver, obstruction of the flow of bile and the enlargement of the spleen; all of which are associated with jaundice. It also promotes the healthy secretion of the bile.

JAUNDICE DIET

Diet therapy and physical rest

Diet therapy and physical rest can cure a mild form of viral jaundice rapidly. Recovery is, however, slow in jaundice caused by obstacle in the bile ducts, depending upon the cause and removal of the cause.

Juice fast, after that an all-fruit diet

The patient should be put on a juice fast for a week, and he should rest until the acute symptoms of the disease collapse. After the juice fast, he may adopt an all-fruit diet for a further three to five days, taking three meals a day of fresh Juicy fruits at five-hourly gaps.

Easy light carbohydrate diet can be then taken.

Thereafter, a simple light carbohydrate diet with exclusion of fats, best obtained from vegetables and fruits, may be restart. Digestive disorder must be avoided. No food with a tendency to ferment or putrefy in the lower intestines like pulses and legumes should be incorporated in the diet.

BREASTFEEDING AND JAUNDICE

Jaundice is due to a buildup in the blood of bilirubin, a yellow pigment which comes from the breakdown of old red blood cells. It is normal for red blood cells to break down, but the bilirubin formed does not usually cause jaundice because the liver metabolizes it and gets rid of it into the gut. The newborn baby, however, often becomes jaundiced during the first few days because the liver enzyme which metabolizes bilirubin is relatively immature. Furthermore, newborn babies have more red blood cells than adults, and thus more are breaking down at any one time. If the baby is premature, or stressed from a difficult birth, or the infant of a diabetic mother, or more than the usual number of red blood cells are breaking down (as happens in blood incompatibility), the level of bilirubin in the blood may rise higher than what is usual.

Breast milk Jaundice

There is a condition commonly called breastmilk jaundice. No one knows what the cause of breast milk jaundice is. In order to make this diagnosis, the baby should be at least a week old, though interestingly, many of the babies with breastmilk jaundice also have had exaggerated physiologic jaundice. The baby should be gaining well, with breastfeeding alone, having lots of bowel movements, passing plentiful, clear urine and be generally well (topic #5 *Is my baby getting enough milk?*). In such a setting, the baby has what some call breastmilk jaundice, though, on occasion, infections of the urine or an under functioning of the baby's thyroid gland, as well as a few other rare illnesses may cause the same picture.Breast milk jaundice peaks at 10-21 days, but may last for 2-3 months. Breastmilk jaundice is normal. Rarely, if ever, does breastfeeding need to be discontinued even for a short time**.** There is not one bit of evidence that this jaundice causes any problem at all for the baby. Breastfeeding should not be discontinued "in order to make a diagnosis". If the baby is truly doing well on breast only, there is *no reason, none*, to stop breastfeeding or supplement with a lactation aid, for that matter. The notion that there is something wrong with the baby being jaundiced comes from the assumption that the formula feeding baby is the standard by which we should determine how the breastfed baby should be. This manner of thinking, almost universal amongst health professionals, truly turns logic upside down. Thus, the formula feeding baby is rarely jaundiced after the first week of life, and when he is, there is usually something wrong. Therefore, the baby with breastmilk jaundice is a concern and "something must be done". However, in our experience, most *exclusively* breastfed babies

who are perfectly healthy and gaining weight well are still jaundiced at 5-6 weeks of life and even later.

TREATMENT FOR JAUNDICE:

Specific treatment for jaundice will be determined by your baby's physician based on:

- your baby's gestational age, overall health, and medical history
- extent of the disease
- your baby's tolerance for specific medications, procedures, or therapies
- expectations for the course of the disease
- your opinion or preference

Treatment depends on many factors, including the cause of the jaundice and the level of bilirubin. The goal is to keep the level of bilirubin from increasing to dangerous levels. Treatment may include:

- **Phototherapy**

Because bilirubin absorbs light, jaundice and increased bilirubin levels usually decrease when the baby is exposed to special blue spectrum lights. Phototherapy may take several hours to begin working and it is used throughout the day and night. The baby's position is changed to allow all of the skin to be exposed to the light. The baby's eyes must be protected and the temperature monitored during phototherapy. Blood levels of bilirubin are checked to monitor if the phototherapy is working.

- **Use Of A Fiberoptic Blanket**

Another form of phototherapy is a fiberoptic blanket placed under the baby. This may be used alone or in combination with regular phototherapy.

- **Exchange Transfusion**

Exchange transfusion may be used to replace the baby's damaged blood with fresh blood. This helps increase the red blood cell count and lower the levels of bilirubin. An exchange transfusion is done by alternating giving and withdrawing blood in small amounts through a vein or artery. Exchange transfusions may need to be repeated if the bilirubin levels remain high.

- **Discontinued Breastfeeding**

Treatment of breast milk jaundice often requires stopping the breastfeeding for one to two days. Giving the baby formula often helps lower the bilirubin levels. Breastfeeding can then be resumed.

- **Treatment Of Underlying Conditions**

Treating any underlying cause of hyperbilirubinemia, such as infection.

CONCLUSION

Jaundice is not a problem but a symptom of a problem. It should not be ignored. Jaundice is the yellow discoloration of the skin or white part of the eyes which signals a dysfunctional liver. Treat jaundice in an adult by seeking medical attention. Jaundice in an adult can be much more serious than in a newborn. An adult may require an ultrasound to check for signs of obstruction, especially if abdominal pain is present. An obstruction may require surgery. Jaundice in an adult may also be caused by a virus and may require prescription medication. Eat healthy if you are an adult with symptoms of jaundice. Lots of fresh fruits and vegetables along with whole-grain breads can help. Of course, to cure jaundice the underlying problem must be corrected. But healthy eating can help to treat jaundice.

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