International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781

Assesment of Knowledge about Jaundice among People of Various Districts in Tamil Nadu

Shanmugam G.[1] *, Jothimanivannan C.[2], Sekar G.[3], Gokulnath M.[1], Dhanasekaran A.[1], Srinivasan M.[1] and Prameshwaran A[1]

[1] *Students, SS Institute of Pharmacy-Sankari.*
[2]*Department of Pharmaceutical Chemistry, SS Institute of pharmacy-Sankari.*
[3]*Department of Pharmacology, SS Institute of pharmacy-Sankari.*

Submitted: 20-04-2023 Accepted: 30-04-2023

ABSTRACT:
Jaundice in adult can be caused by a wide variety of benign or life threatening disorders. Newborn jaundice occurs when a baby has a high level of bilirubin in the blood. Bilirubin is a yellow substance that the body creates when it replaces old red blood cells. The liver helps to break down the substance and so it can be removed from the body in the stool. High plasma bilirubin level (hyperbilirubinemia) can cause various manifestations involving gastrointestinal bleeding, diarrhoea, anemia, edema, weight loss and can be fatal.The objective was to assess the knowledge about jaundice disease among the people of Tamil Nadu. A cross sectional study was carried out among 200 people in various districts between November – December 2022 by using Google form containing 15 MCQ type questionnaire. The descriptive statistics were calculated using Microsoft excel. 200 people responded to that questionnaire and their knowledge about jaundice was assessed.

KEYWORDS: Bilirubin, Hyperbilirubinemia, Jaundice, Knowledge assessment,Cross sectional study.

AIM AND OBJECTIVE:
The main aim of this present study is to assess the knowledge about the jaundice among the people of Tamil Nadu.

I. INTRODUCTION:

Jaundice is when clinically there is an increase in the amount of bilirubin in serum rising above 85mmol/L (5mg/dl). When in utero, unconjugated bilirubin is cleared in the placenta to produce cord serum bilirubin of approximately 35mmol/L (2mg/dl). After birth, jaundice is a reflection of the bilirubin present in the liver, the rate of hepatic excretion and the ability to bind to serum proteins to retain the bilirubin present in the plasma. Many variations in individual responses to bilirubin load prevent specific levels of psychological Jaundice[1] Jaundice is defined as a yellowing of skin, mucous membranes and sclera due to the deposition of yellow orange bile pigment i.e. bilirubin[2] The bilirubin is an endogenously synthesized pigment that can be toxic specially in new born children[3]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 process 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 product (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 the 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 from 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 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 Moms milk comes

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781

in and stooling begins in earnest, bilirubin accumulates more easily.
Jaundice is more common in premature babies.

HISTORY:

- Jaundice comes from the French word jaune in circa 1300 AD, meaning yellow. And the word 'jaunis' itself is derived from an earlier French word 'jalnice'[4]
- In 1885, Luhrman noted jaundice as an adverse effect of vaccination[5]
- In 1908, McDonald suggested that jaundice may be caused by an agent much smaller than a bacterium[6]
- In 1935, A. O. Whipple, an American surgeon first described obstructive jaundice[7]

TYPES:

On the basis of causes Jaundice can be classified into three types.

- Pre hepatic Jaundice
- Hepatic Jaundice
- Post hepatic Jaundice

Pre hepatic Jaundice is such type of Jaundice which is caused due to hemolysis therefore it is also known as hemolytic jaundice. The major cause of enhanced hemolysis is defective plasma membrane of red blood cells. This vulnerable cell membrane cannot bear the shear stress and hence ruptures resulting in hemolysis thus causing the increased serum bilirubin level [8][9]

Pre hepatic: This occurs before the liver processes the waste and results in higher unconjugated bilirubin levels.
Hepatic: This occurs in the liver and results in both higher conjugated and unconjugated bilirubin levels
Post hepatic: This occurs after the liver has processed the waste and results in higher conjugated bilirubin levels.

ETIOLOGY:

Pre Hepatic Jaundice

It is mainly caused due to hemolysis. The causes of pre-hepatic/hemolytic jaundice are classified into two groups:

Congenital Causes

Congenital causes of hepatic jaundice involve following:

- Spherocytosis
- Elliptocytosis
- Congenital LCAT deficiency
- Thalassemia
- Sickle cell anemia
- Stomatocytosis
- Acanthocytosis
- Echinocytes
- GSH synthase deficiency
- Pyruvate kinase deficiency
- G6PD deficiency
- Erythroblastosis fetalis

Acquired causes

Acquired causes of pre-hepatic jaundice involve following:

- Resorption of extensive hematomas
- Auto immune hemolysis
- Transfusion reactions
- Trauma
- Microangiopathy
- Hemolytic uremic syndrome
- Long distance runners
- Disseminated intravascular clot
- Infections e.g. malaria, etc.
- Toxins e.g. snake venoms, etc.
- Chemicals e.g. nitrites, aniline dyes,etc.
- Paroxysmal nightly hemoglobinuria
- Thrombotic thrombocytopenic purpura
- Hypophosphatemia
- Vitamin B12 deficiency
- Folic acid deficiency

Clinical presentations

Patients with hemolytic jaundice are presented with Anemia, Yellowing of sclera, dark yellow-brown colored urine, yellowish skin and high bilirubin levels.

Hepatic Jaundice

Causes of the hepatic jaundice can be classified in to two types:

Congenital causes

Congenital causes of hepatic jaundice are following:

- Wilson's Disease
- Rotor's Syndrome
- Haemochromatosis
- CriglerNajar syndrome
- Gilbert's syndrome
- Dubin-Johnson's syndrome

Acquired causes

Acquired causes of hepatic jaundice are following:

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781

- Viral Hepatitis
- Alcoholic Hepatitis
- Auto immune Hepatitis
- Drug related Hepatitis (e.g. NSAIDs)
- Sepsis
- Pregnancy
- Systemic Diseases (e.g. celiac disease)
- Malnutrition
- Physical Trauma
- Hepatic Adenoma

Clinical presentations

The clinical presentations of hepatic jaundice include abdominal pain, fever, vomiting and nausea along with the complications involving satiety, gastrointestinal bleeding, diarrhea, anemia, edema, weight-loss and associated weakness, if unchecked leading to mental disturbances like kernicterus, coma or even death.

Post Hepatic Jaundice

The major cause of post hepatic jaundice is extra-hepatic biliary obstruction. The causes of obstruction may be classified into two types:

Congenital causes

The congenital obstruction involves following:

- Biliary Atresia
- Cystic Fibrosis
- Idiopathic dilation of common bile duct
- Pancreatic biliary malfunction
- Choledochal Cyst

Acquired Causes

The acquired obstruction involves following:

- Portal biliopathy
- Cholecystitis
- Trauma
- Pancreatitis
- Strictures
- Choledocholithiasis
- AIDS
- Intra-Abdominal Tuberculosis
- Tumors
- Common bile duct Obstruction

Clinical presentation

The clinical manifestations of obstructive jaundice are dark urine, pale stools and generalized pruritus. History of fever biliary colic, weight loss, abdominal pain and abdominal mass are also the representatives of obstructive jaundice. Obstructive Jaundice may lead to various complications including cholangitis, pancreatitis, renal and hepatic failure.

SYMPTOMS OF JAUNDICE :

Following are the major jaundice symptoms:[10]

- ❖ Yellow skin and the white part of the eyes (sclera) When Jaundice is more severe the area may look brown.
- ❖ Yellow color inside the mouth.
- ❖ Dark or Brown colored urine.
- ❖ Pale or clay-colored stools.
- ❖ Itching (puritis) usually occurs with Jaundice.

Treatment:

Nutritional support:

Bile mediates the intestinal absorption of fat and fatsoluble vitamins. In cholestasis liver diseases, the defective absorption of fat and fat-soluble vitamins (vitamins A, D, E, and K) is commonly observed but clinically obscure. Fat malabsorption results in calorie insufficiency and failure to thrive, especially in early childhood. Patients are advised to use formulas containing medium-chain triglycerides or add oils containing medium-chain triglycerides to their food. Deficiency in fat-soluble vitamins may result in multiple organ dysfunctions, including rickets, coagulopathy, and defective neurological, immunological and visual functions. Without supplementation, symptoms of deficiency, such as coagulopathy, osteoporosis, fracture, growth failure and life-threatening hemorrhage, may occur in patients. In addition, deficiencies in fat-soluble vitamins may also cause inadequate anti-oxidation, which is frequently overlooked in clinical patients.

Medical treatment:

Although jaundice is the common manifestation of the highly variable etiologies, treatment does not target only to jaundice improvement (to reduce serum bilirubin level), but to target the underlying disorders that may cause hepatobiliary injury and progressive fibrosis and cirrhosis, which is usually associated with elevated bile acid levels or abnormal metabolites. Additional treatment goals are to improve nutritional status, pruritus and life quality, to prevent or to treat cirrhosis related complications. PFICs, Alagille syndrome, and inborn errors of bile acid synthesis are the most devastating disorders that cause cirrhosis and may need liver transplantation. Effective treatment options for PFICs and Alagille syndrome are limited. Several drugs are under investigation and clinical trial. Here we will discuss

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781

about the stand and treatment and several newly developed therapeutic strategies for these disorders. Ursodeoxycholic acid (UDCA) has widely been used to treat cholestatic liver disease and is effective to improve biochemical parameters and pruritis[11]However, UDCA is not an ideal therapeutic option for PFIC2 patients with BSEP defects. In animal models, UDCA may Chen et al. Journal of Biomedical Science (2018) 25:75 Page 8 of 13 aggravate liver injury due to the inability of BSEP to export UDCA from hepatocytes[12]. There is a need to develop new drugs targeting BSEP defects. Missense mutations in BSEP/ABCB11 impair protein translation or intracellular trafficking, which reduce canalicular expression of BSEP and eventually cause cholestasis. Recent studies have indicated that 4-phenylbutyrate (4-PB, Buphenyl), a clinically approved pharmacological chaperone, can be used to restore the canalicular expression of BSEP. By using MDCK II cells and SD rats, Hayashi et al. reported that 4-PB significantly relocalizes and enhances the cell surface expression of both wild-type and mutated rat Bsep[13]

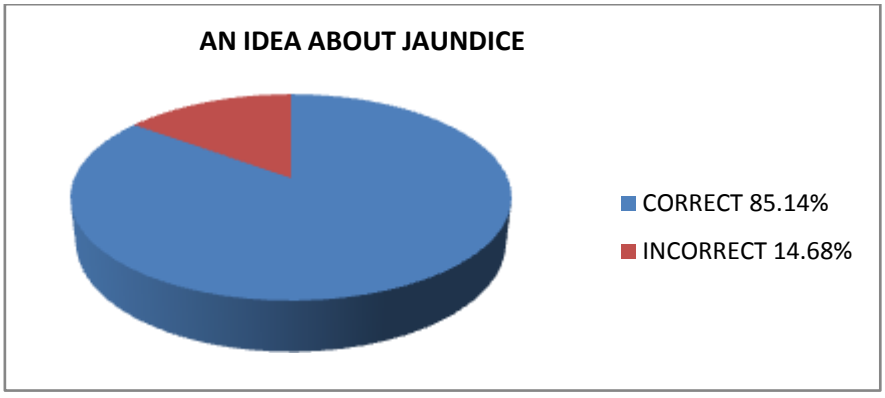
The recently developed FXR agonist (Obeticholic acid) has been demonstrated to improve the ALP level in primary biliary cirrhosis[14], and has also been investigated for the treatment of nonalcoholic steatohepatitis (NASH)[15-17]

II. METHODS

The Cross-sectional study was conducted over a period of one month (15th February to 15th March) of 2023 Among the common people in Tamil Nadu. The sample size is about 200 people. A semi structured questionnaire was adopted from previous studies with minor changes to suit the study population and the questionnaire was validated by faculties of SS Institute of Pharmacy. It consists of 15 questions on knowledge of Jaundice. Out of 15 Questions, 9 questions where Multiple choice questions and 6 where Yes/No type questions. The questionnaire was distributed over students and people through Google form, all the 15questions were compulsory, Restrictions were set, only one response can be submitted by an individual student. Each correct answer and each positive response were given a score of one whereas the negative response or wrong responses were given a score of 0. The maximum score was 15. The responses were collected and the data were analyzed in a statistical manner.

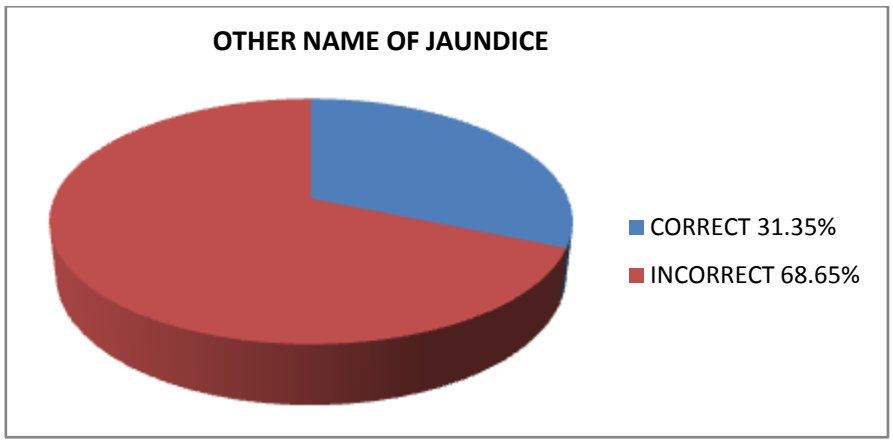
III. RESULT:

1. An idea about Jaundice, out of 200 responses, 170 people (85.14%) of them answered correctly and 30 people(14.86%) of them answered incorrectly. It indicates that most of them have enough knowledge about causes of Jaundice.

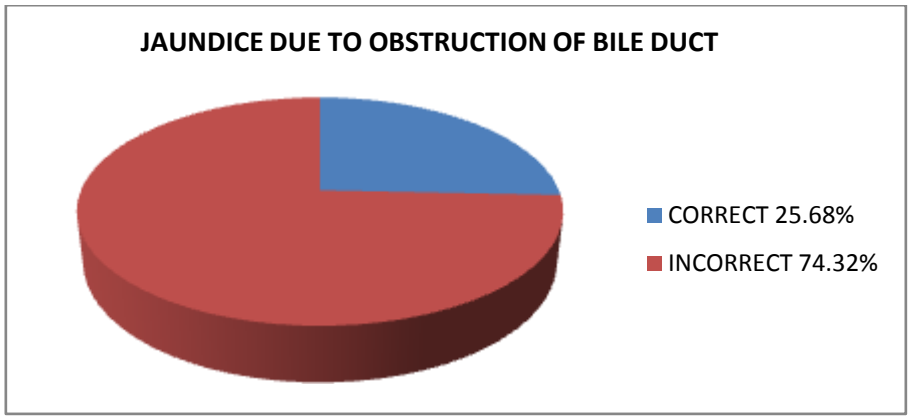


2. Other name of Jaundice, out of 200 responses, 62 people (31.35%) of them answered correctly and 138 people (68.65%) of them answered incorrectly. It indicates that most of them are lacking in/about this information.

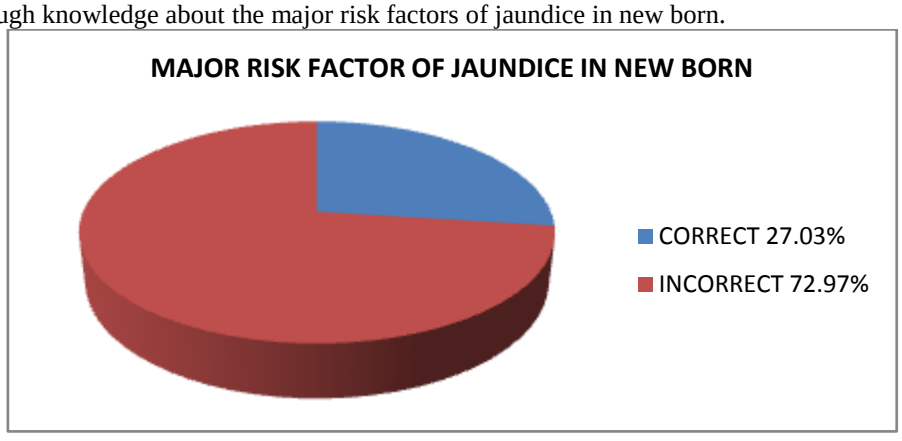
International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781



3. Jaundice due to obstruction of bile duct, out of 200 responses, 51 people (25.68%) of them answered correctly and 149 people (74.32%) of them answered incorrectly. It indicates that most of the people do not have enough knowledge about Jaundice due to obstruction.

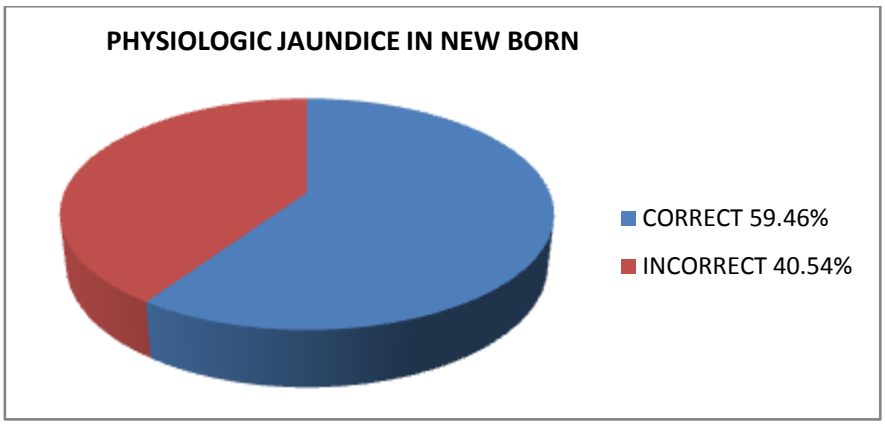


4. Major risk factor of jaundice in new born, out of 200 responses, 54 people (27.03%) of them answered correctly and 146 people (72.97%) of them answered incorrectly. It indicates that most of the people do not have enough knowledge about the major risk factors of jaundice in new born.

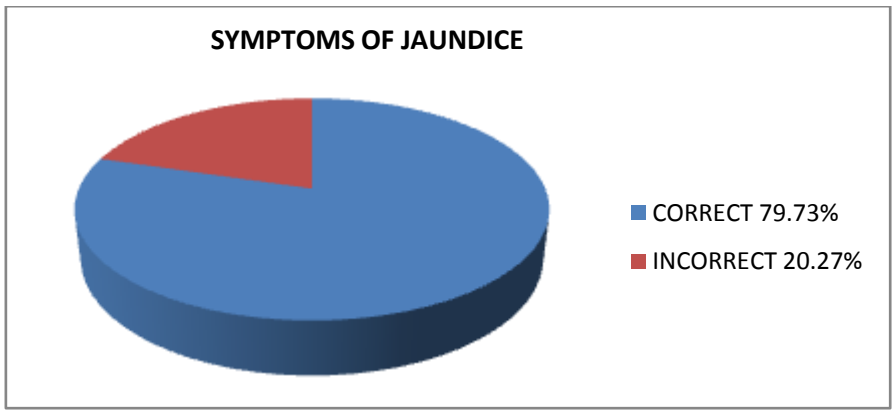


5. Physiologic jaundice in new born, out of 200 responses, 119 people (59.46%) of them answered correctly and 81 people (40.54%) of them answered incorrectly. It indicates that most of them have enough knowledge about physiologic jaundice in new born.

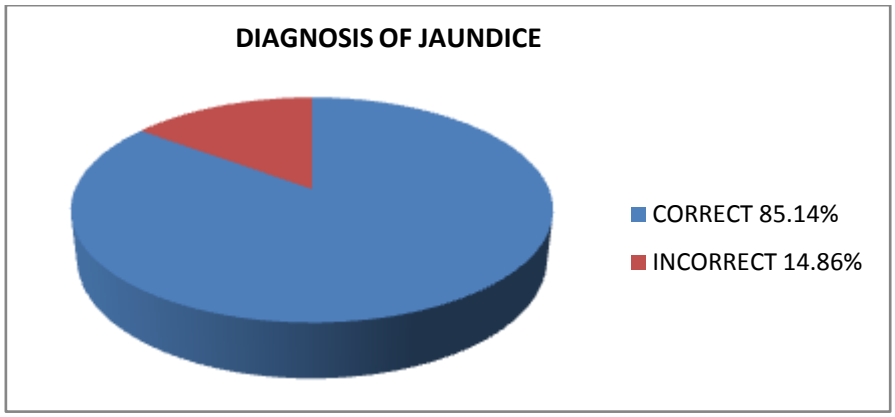
International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781



6. Symptoms of jaundice, out of 200 responses, 159 people (79.73%) of them answered correctly and 41 people (20.27%) of them answered incorrectly. It indicates that most of them have enough knowledge about the symptoms of jaundice.

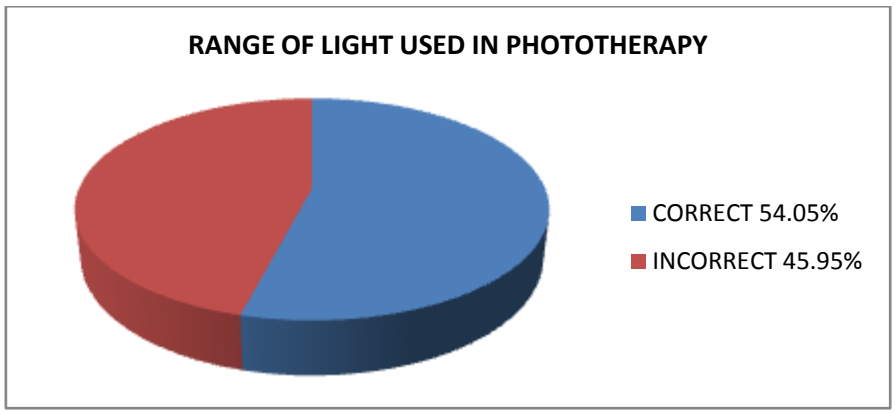


7. Diagnosis of Jaundice, out of 200 responses, 170 people (85.14%) of them answered correctly and 30 people (14.86%) of them answered incorrectly. It indicates that most of them have are aware of diagnosis of jaundice.

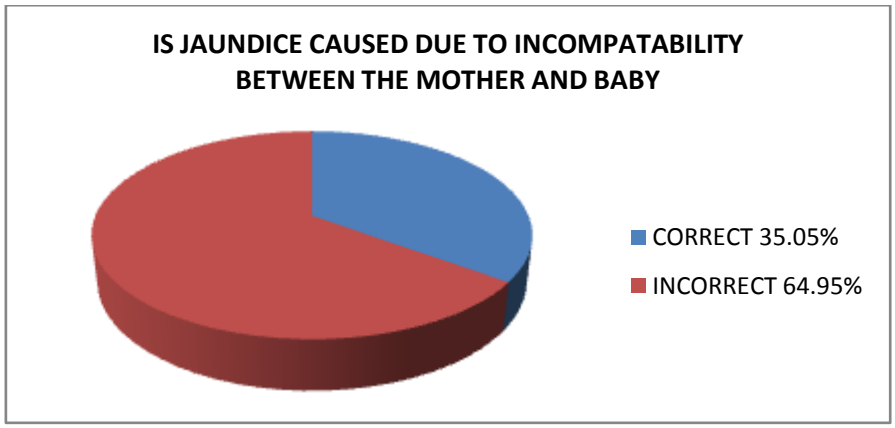


8. Range of light used in phototherapy, out of 200 responses, 108 people (54.05%) of them answered correctly and 92 people (45.95%) of them answered incorrectly. It indicates half of the populations have enough knowledge about the range of light used in phototherapy.

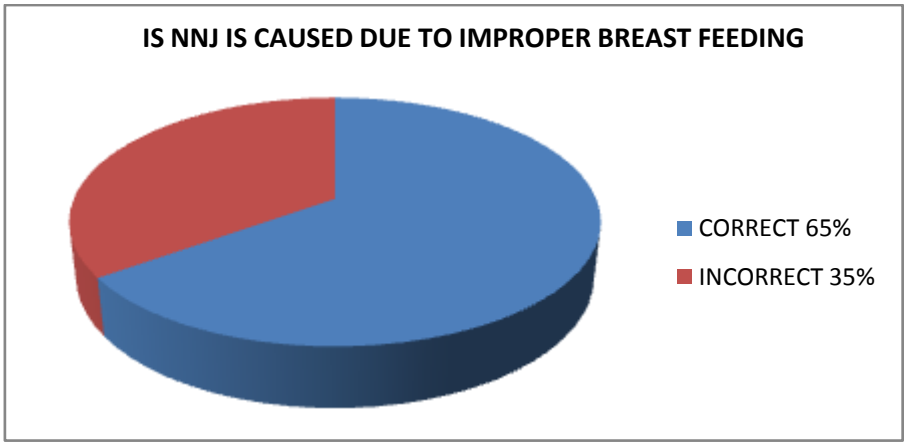
International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781



9. Is jaundice caused due to blood incompatibility between the mother and baby, out of 200 responses, 70 people (35.05%) of them answered correctly and 130 people (64.95%) of them answered incorrectly. It indicates that most of them have poor knowledge about it.

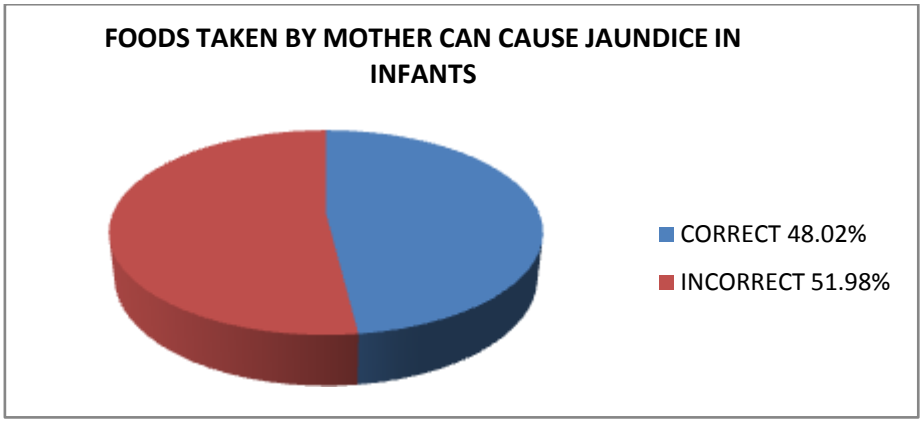


10. Is NNJ is caused due to improper breast feeding, out of 200 responses, 130 people (65%) of them answered correctly and 70 people (35%) of them answered incorrectly. It indicates that most of them have average knowledge about NNJ.

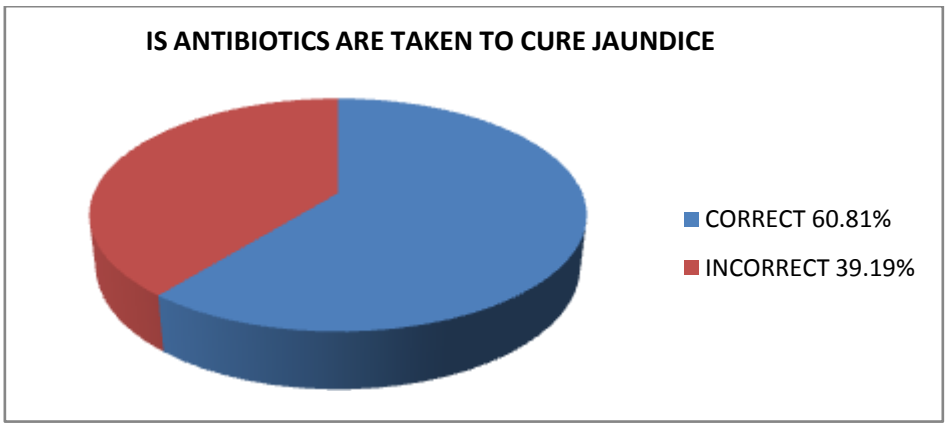


11. Foods taken by mother can cause jaundice in infants, out of 200 responses, 96 people (48.02%) of them answered correctly and 104 people (51.98%) of them answered incorrectly. It indicates that most of the people do not have enough knowledge about this statement.

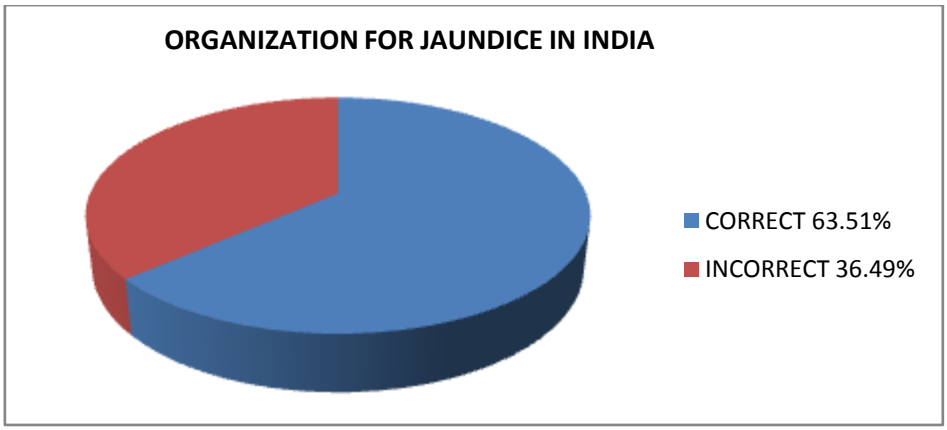
International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781



12. Is antibiotics are taken to cure jaundice, out of 200 responses, 122 people (60.81%) of them answered correctly and 78 people (39.19%) of them answered incorrectly. It indicates that most of them have knowledge about this statement.

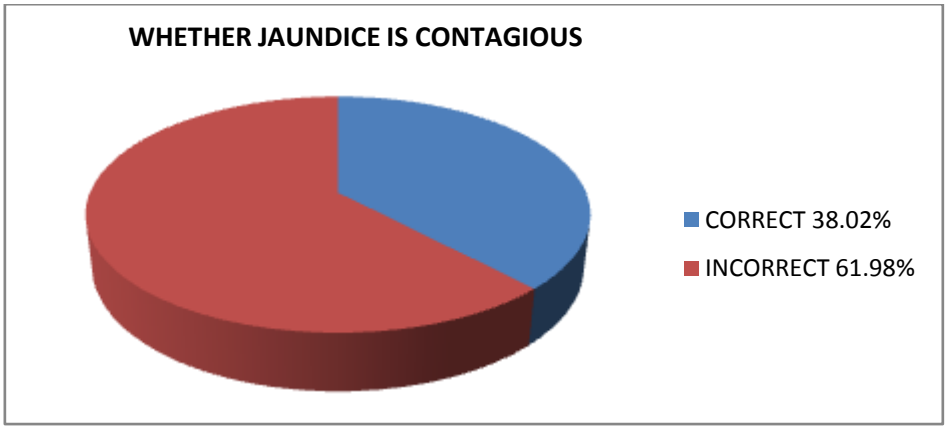


13. Organization for jaundice in India, out of 200 responses, 127 people (63.51%) of them answered correctly and 73 people (36.49%) of them answered incorrectly. It indicates that most of the students have enough knowledge about the organization for jaundice.

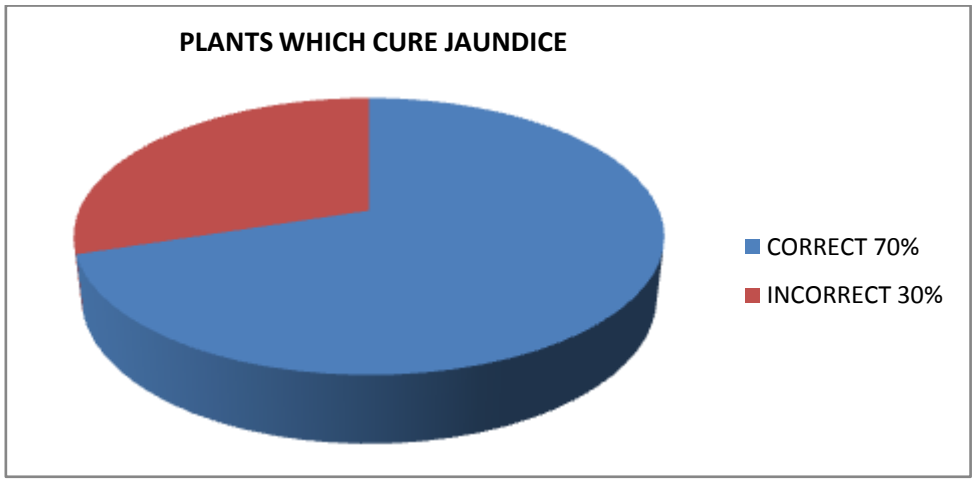


14. Whether jaundice is contagious, out of 200 responses, 76 people (38.02%) of them answered correctly and 124 people (61.98%) of them answered incorrectly. It indicates that most of them have enough knowledge about the statement.

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781



15. Plants which cure jaundice, out of 200 responses, 140 people (70%) of them answered correctly and 60 people (30%) of them answered incorrectly. It indicates that most of them answered incorrectly.



IV. OVERALL RESULT:

Total 200 responses were collected through Google form. Among 15 questions, 9 questions were MCQ type.

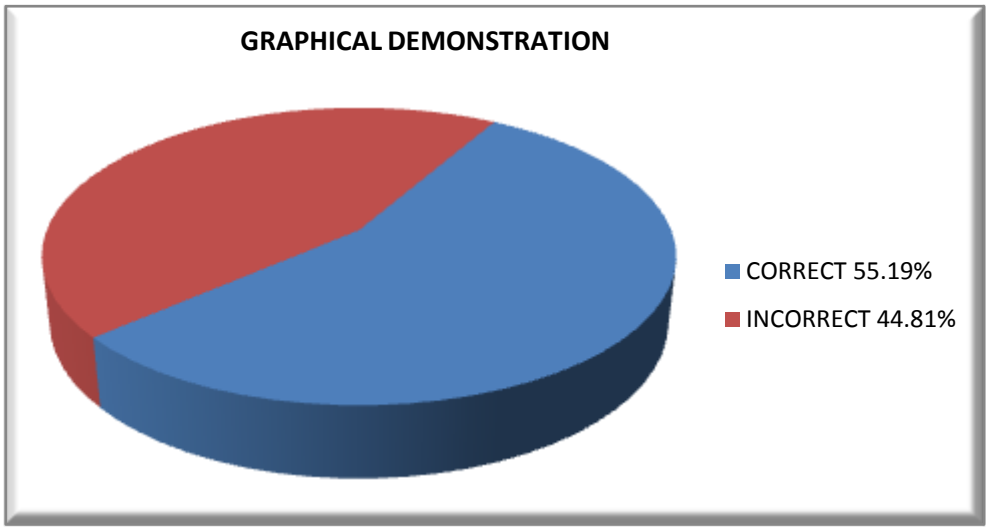
From those 200 responses, 55.19% of them answered correctly and the equal amount of 44.81% of them answered incorrectly.

I.e. averagely 110 people answered correctly and 90 people answered incorrectly.

The correct answers were given to direct and simple questions, Maximum correct answers were given to 1st,6th and 7th question (Cause, symptoms, diagnosis of jaundice)

Apart from these questions, the balance questions helped to assess the knowledge among the people about the Jaundice.

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 2 Mar-Apr 2023, pp: 2005-2015 www.ijprajournal.com ISSN: 2249-7781



V. DISCUSSION:

Jaundice is when clinically there is an increase in the amount of bilirubin in serum rising above 85mmol/L (5mg/dl). The objective of the present was to assess the knowledge about jaundice disease among the people of Tamil Nadu. A cross sectional study was carried out among 200 people in various districts between November – December 2022 by using Google form containing 15 MCQ type questionnaires [18] The descriptive statistics were calculated using Microsoft excel. 200 people responded to that questionnaire and their knowledge about jaundice was assessed. Majority have them have only a basic knowledge about the term Jaundice, majority of them knew the definition, causes and symptoms and similar related findings. Most of them were unaware of the therapy used in jaundice, incompatibility studies in jaundice and contagious profile of jaundice.

VI. CONCLUSION:

Jaundice is very common disease. Yellowing of skin, sclera and mucous membranes are common manifestations of jaundice due to defect in production, metabolism and excretion of bilirubin. The causes of jaundice are either congenital or acquired. Serum bilirubin level and ultrasonography are used for differential diagnosis. High water intake and low fat diet are best proper managements of jaundice. The treatment of jaundice varies with the type of jaundice.Jaundice is not a problem but a symptom of a problem. It should not be ignored. 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.

The present study concludes that the majority half of the people is still lacking in knowledge about Jaundice. The finding suggests the urgent need of frequent education programs or trainings to raise awareness towards Jaundice. The neonatal mortality ratio associated with maternal jaundice was 2.2 per 1000 live births,

1. Of 18 infants, 4(22%) died on the date of birth
2. 14(78%) died within the first week of life[19]

Health authorities should take necessary steps to design interventional programs in order to increase the knowledge and awareness of Jaundice in people.

ACKNOWLEDGEMENT:

The authors would like to thank the teaching faculties of SS INSTITUTE OF PHARMACY for their guidance and support to finish this case study. The authors would also like to thank the people from various districts in Tamil Nadu who had submitted their responses through the Google form and allowed to assess their knowledge.

REFERENCE:

[1]. Bassari R, Koea J B (2015) Jaundice associated pruritis: a review of

pathophysiology and treatment. World J Gastroenterol 21(5): 1404-1413

[2]. Roche SP, Kobos R. Jaundice in the adult patient.Am Fam Physician. 2004;69(2):299-304.

[3]. Tiribelli C,Ostrow JD.The molecular basis of bilirubin encephalopathy and toxicity: report of an EASL single topic conference. J Hepatol.2005;43:156-6

[4]. "www.etymonline.com".

[5]. Trepo, Christian (2014). "A brief history of hepatitis milestones". Liver International. 34: 29–37. doi:10.1111/liv.12409. ISSN 1478-3223.

[6]. Schmid R (1986). "Viral hepatitis: dogmatism revisited". Trans. Am. Clin. Climatol. Assoc. 97: 53–7. PMC 2279696. PMID 3915843.

[7]. Whipple AO, Parsons WB, Mullins CR (1935). "TREATMENT OF CARCINOMA OF THE AMPULLA OF VATER". Ann Surg. 102 (4): 763–79. PMC 1391173. PMID 17856666.

[8]. Wickramasinghe SN, Wood WG. Advances in the understanding of the congenital dyserythropoieticanaemias. Br J Haematol.2005;131:431-46.

[9]. Glader B. Anemia: general consideration. In: Greer JP, eds. Wintrobe's Clinical Hematology. Chapter 27. Lippincott, Williams & Wilkins Co; 2004:965-75.

[10]. htts//www.mountsinai.org

[11]. Paumgartner G, Beuers U. Ursodeoxycholic acid in cholestatic liver disease: mechanisms of action and therapeutic use revisited. Hepatology. 2002;36: 525–31.

[12]. Chen HL, Chen HL, Yuan RH, Wu SH, Chen YH, Chien CS, Chou SP, et al. Hepatocyte transplantation in bile salt export pump-deficient mice: selective growth advantage of donor hepatocytes under bile acid stress. J Cell Mol Med. 2012;16:2679–89

[13]. Hayashi H, Sugiyama Y. 4-phenylbutyrate enhances the cell surface expression and the transport capacity of wild-type and mutated bile salt export pumps. Hepatology. 2007;45:1506–16

[14]. Hirschfield GM, Mason A, Luketic V, Lindor K, Gordon SC, Mayo M, Kowdley KV, et al. Efficacy of obeticholic acid in patients with primary biliary cirrhosis and inadequate response to ursodeoxycholic acid. Gastroenterology. 2015; 148:751–761.e758.

[15]. Mudaliar S, Henry RR, Sanyal AJ, Morrow L, Marschall HU, Kipnes M, Adorini L, et al. Efficacy and safety of the farnesoid X receptor agonist obeticholic acid in patients with type 2 diabetes and nonalcoholic fatty liver disease. Gastroenterology. 2013;145:574–582.e571.

[16]. Neuschwander-Tetri BA, Loomba R, Sanyal AJ, Lavine JE, Van Natta ML, Abdelmalek MF, Chalasani N, et al. Farnesoid X nuclear receptor ligand obeticholic acid for non-cirrhotic, non-alcoholic steatohepatitis (FLINT): a multicentre, randomised, placebo-controlled trial. Lancet. 2015;385:95665.

[17]. Beuers U, Trauner M, Jansen P, Poupon R. New paradigms in the treatment of hepatic cholestasis: from UDCA to FXR, PXR and beyond. J Hepatol. 2015; 62:S25–37.

[18]. Gokulnath M, Jothimanivannan C, Sasikumar V, Sampath, Arun S, Dhanasekaran A, and Srither R. Assessment of Knowledge about Pharmacovigilance among Pharmacy Students. World Journal of Pharmaceutical Research, e- ISSN: 2277-7105. 31 July 2022, Volume 11,Issue 11, p-1592-1605. DOI: 10.20959/wjpr202211-25197.

[19]. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3519295/