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A Critical Analysis of Neonatal Jaundice: The Synergy of Ayurveda and Phototherapy

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Abstract: ***Elevated levels of bilirubin in the blood can cause yellowing of skin, sclera and mucous membranes in newborn with jaundice, which is a common condition. There are two types of jaundice: Physiological, which is usually harmless and goes away on its own, and pathological, which can lead to serious issues such as bilirubin encephalopathy if not treated. Various factors contribute to the development of jaundice, including immature liver function in new - borns, blood group inculpabilities and enzyme deficiencies. The primary treatment method is phototherapy, which help the body eliminate bilirubin. However, possible complications including dehydration and electrolyte imbalance. According to Ayurveda newborn jaundice is related to Pittaja stanya dushti and can be treated using both Shamana (palliative) and Sanshodhan (cleaning) remedies. A comprehensive approach to treating this illness could be achieved by combining ayurvedic concept with contemporary.***

Keywords: *Ayurveda*, Bilirubin encephalopathy, Hyperbilirubinemia, Neonatal jaundice, Phototherapy, *Pittaja stanya Dushti*

1. Introduction

The condition in which the elevation of total serum bilirubin (TSB) occurs causes neonatal jaundice, also known as neonatal hyperbilirubinemia, which is clinically characterized by yellowish colouring of the skin, sclera, and mucous membranes. Word "jaundice" arises from the French word "jaune, " which implies yellow color. It is the most frequent medical issue occurring within the first two weeks of life and is frequently the reason for postpartum readmission to the hospital. [i] It has been estimated that between 60% and 80% of healthy newborns would exhibit idiopathic neonatal jaundice. [ii] As a result, it could make parents nervous and doctors worried. The National Neonatal - Perinatal Database (NNPD) reports that the rate of neonatal hyperbilirubinemia in live deliveries that occur at the home is 3.3%, but the rate of morbidity resulting from hyperbilirubinemia in extramural admissions is 22.1%. [iii] Jaundice is classified two types one is known as "physiological jaundice, " which is typically a mild, transient, and self - limiting condition that resolves without medical intervention another serious form known as "pathological jaundice. " Failure to identify and treat this illness may result in bilirubin encephalopathy and other neurological issues.

Similar to uric acid, bilirubin is not only an unpleasant molecule with detrimental effects but also an essential anti - oxidant that circulates in a neonate's biological system. [iv] Hyperbilirubinemia is related to two other groups of disorders. One is unconjugated hyperbilirubinemia, characterized by red blood hemolysis, upper intestine blockage, congenital hypothyroidism, breastfeeding and breast milk jaundice, Gilbert syndrome, Crigler Najjar syndrome, and drug - induced hyperbilirubinemia. Another one is conjugated non - cholestatic hyperbilirubinemia is an indication of Rotor syndrome and Dubin - Johnson syndrome. [v] Most new - borns with clinical jaundice have unconjugated hyperbilirubinemia (UHB), but some have conjugated hyperbilirubinemia (CHB), which is usually dangerous and indicates an underlying medical or surgical aetiology. Pathological UHB and CHB have a wide range of aetiology. Unconjugated bilirubin's negative effects on the central nervous system are particularly dangerous for preterm infants and those born with congenital enzyme impairments. [vi] If left untreated, severe hyperbilirubinemia can result in acute and chronic bilirubin encephalopathy as well as bilirubin - induced neurological dysfunction (BIND) [vii] A subgroup of patients also benefit from intravenous immunoglobulin (IVIG), which is the basis of treatment for UHB along with phototherapy and exchange transfusions. [viii] Because of the weakened blood brain barrier during the neonatal period, most cases of neonatal jaundice are physiological, and the level of serum bilirubin is not elevated enough to cause fatal brain damage from bilirubin encephalopathy. But every case of neonatal jaundice should be managed with great care in order to avoid these consequences.

New - born are having more prone to suffer from the condition, due to a temporary lack of receptor proteins and the UDPGT enzyme, particularly premature ones, it results in physiological polycythaemia, a shortened fatal RBC lifespan, and limited hepatic uptake, conjugation, and excretion of bilirubin. Other contributing factors are insufficient gut bacterial flora and excessive beta - glucuronidase enzyme activity in new - born. The main causative factors behind the higher prevalence of jaundice in new - borns are increased bilirubin generation, decreased liver clearance and greater enterohepatic circulation. [ix] Physiological jaundice immaturity, blood group incompatibility, prenatal and postnatal infections, G - 6PD deficiency, cephalohematoma, certain medicines, and breast milk jaundice are the other frequent causes of newborn jaundice in India, according to incidence. [x] There are many management techniques for newborn jaundice discovered by contemporary medicine.

Aim & Objectives: -

- To compile the herbal drugs reported for the management of *Kamala* (hyper bilirubinaemia)
- To evaluate phototherapy impact on the control of neonatal jaundice

2. Material & Methods

The *Kashyap Samhita, Charaka Samhita,* and *Sushurut Samhita* are the traditional *ayurvedic* classics used in this study. Modern textbooks using digital media, the *Ayush* research portal, PubMed, Google Scholar, and other websites on the internet related to the subject were also studied.

Ayurvedic Approach of Neonatal Jaundice

According to *Ayurveda* classic of *Kaumarbhritya*, Jaundice is characterized by Peet Chakshu (yellow discolouration of the eyes), Nakha (nails), Mukha (face), Vinha - Mutra (faces and urine) as well as *Nirutsaaha* (laziness), *Nashtagni* (loss of digestive ability) and *Rudhirspriha* (urge to draw blood). [xi] Another fact describes the baby dies after delivery on the first day due to *Pishachi Jataharini*, which is recognized for its yellow colour[xii] *Paittik Stanyadusti*, particularly *Durgandhit Stanyadusti.* When a baby feeds breastmilk that is tainted by the *Pitta Dosha* can also cause symptoms including excessive thirst, body aches, sweating, and loose stools. [xiii] In *Ayurveda,* the symptoms of neonatal Jaundice resemble the symptoms of *Kamala*. It is divided in two types according to *Charaka, Sakhasrita Kamala* and *Kosthasrita Kamala.* Two other types also mentioned in *Charaka, Kumbha Kamala and Halimaka. Sakhasrita Kamala* is obstructive in nature by *Kapha* which *Pratyamaka Linga* is *Peet chakshu* (yellowishness of eye), *Mutra* (urine) and *Twak* (skin) along with *Tila Pisti* (clay colour or white colour stool). In highly *Pattic* condition of *Kosthasrita Kamala* which features are yellowishness of eyes, urine and skin resembles like toad's skin and functions of *Indriyas are* diminished. In chronicity of *Kamala Koshta* becomes like a pot and it is called *Kumbha Kamala. Halimaka* is *Vata Pitta Dosha Prakopaka stage of Kamala* in which *Mandagni, Mridu Jwara* and other features of *Kamala* are present. This condition is called as *Lagharaka* by *Sushruta*. Important associated features of jaundice are *Sharira Kandu* (pruritus) due to accumulation of bile salts beneath the skin (affecting *Bhrajaka Pitta*) and Bradycardia due to toxic effect of bilirubin on heart (affecting *Sadhaka Pitta*). [xiv] According to *Charaka Samhita* Management of *Kamala* is in two steps *Sanshodhan Chikitsa* then *Samshamana Chikitsa*, in *Sanshodhan Chikitsa Snehan* with *Tikta Sneha* and *Mridu Virechan* with milk and *Gau - Mutra*, *Shamana Chikitsa* according to *Dosha*. [xv]

Table 1: Showing *Nidana* of *Bahupitta Kamala*[xvi]

Aharaja Nidana:	Excessive *Kshara, amla, lavan* *Virudha anna* *Vidagdha anna* *Asatmaya bhojan* *Nishpava, Masha, Pinyaka, Tila*
Viharaj Nidana	*Ativyayama* *Ati maithuna* *Diwaswapna* *Vega - dharana*
Manasika nidana	*Kaama* *Chinta* *Bhaya* *Krodha* *Upahata Chesta*

Table 2: Showing *Nidana* of *Rudhaopatha Kamala* (obstactive jaundice) [xvii]

Aharaja Nidana	Exessive intake of *ruksha, Sheet, Ahara* *Madhur rasa Ahara*
Viharaj nidana	*Ativyayama* *Vega dharana*

***Kamala* is a *Nidanarthak Vyadhi* of *Pandu* and other disease**

Kamala is a *Pandu Nidhanarthak Vyadhi* and other aliments According to *Acharya Charaka, Pandu* is one of the reasons for *Kamala*. For example, *Pandu* can be produced by *Santrapana* and *Virudhahar*, which act as a *Nidana* for *Kamala*. [xviii]

Indirect *Nidana* of *Kamala*

According to the principles of *Acharya Charaka* and *Vagabhat, Kamala* is caused by vitiation of the *Raktavaha Srotas*, making it a *Rakta Pradoshaja Vyadhi*. The etiological factors that cause *Rakta Dushti* are almost similar to those that cause *Pitta Prakopa* such as *Ushna*, *Vidahi Dadhi*, *Taila*, *Snigdha*, *Kshara*, *Anupa Mamsa Sevan* and *Krodha*, which leads to *Kamala*. When *Rakta* is vitiated, the circulating channels also become affected, those affects the *Yakrit* (liver) and *Pliha* (spleen) and leads to *Kamala*. Therefore, the *Nidana* of *Rakta Dusti* indirectly cause *Kamala*. [xix]

***Samprapti* of *Kamala* (neonatal jaundice) [xx]**

Pitta, the predominant bodily humor, worsens due to causative factors, which leads to the vitiation of the blood. When the blood is affected, the liver and spleen, which are the primary sites of blood formation, also become imbalanced. This imbalance causes a decrease in both the quality and quantity of blood. The liver maintains the quality of blood by regulating bilirubin metabolism, and the spleen maintains the quantity by controlling the breakdown of red blood cells. Excessive movement and movement in the opposite direction of aggravated Pitta cause the *Rakta* and *Mamsa Dhatu* to become impaired, this aggravated *Pitta* being manifested in the skin, blood, and muscle tissues.

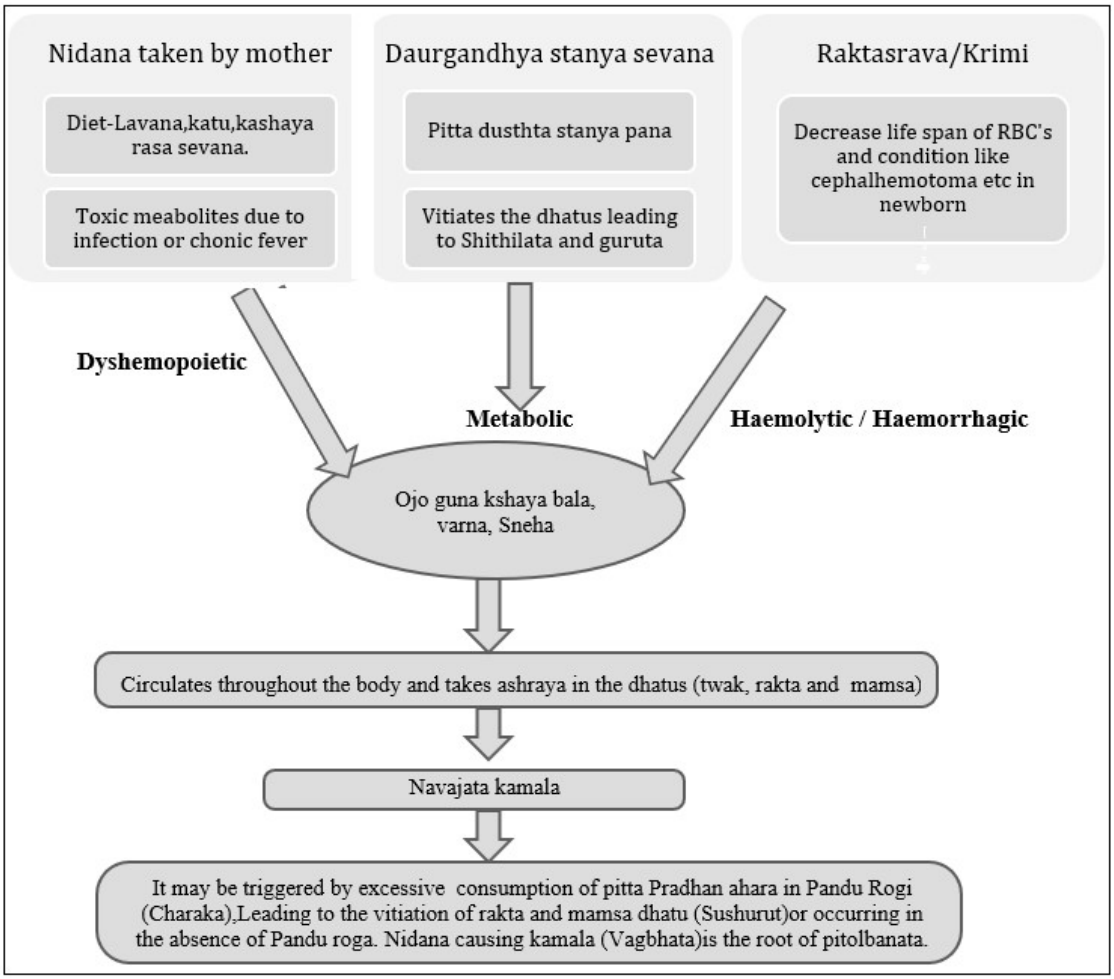

Figure 1: Showing the Samprapti of Kamala

Table 3: Showing *Samprapti Ghataka* of *Kamala*

Dosha	Pitta
Dushya	Rakta, Mamsa
Adhishthana	Koshta; Mahasrotasa - Yakrita Shakha; Raktadi and twak
Srotas	Rasavaha, Raktavaha, Annavaha, Pureeshvaha
Srotodusti	Atipravritti, Sanga, Vimargagamana

Management of Neonatal Jaundice:

Impact of Phototherapy in management of Neonatal Jaundice

The value of phototherapy in lowering unconjugated hyperbilirubinemia is widely accepted. It should be remembered that bilirubin absorbs blue - green light maximally at 460 - 490 nm with light sources of this range, most of it undergoes photoisomerization to bilirubin. A small portion gets oxidised to biliverdin. These are excreted in bile and to a lesser extent in urine. That bilirubin broken down in the skin is now well documented. A common observation during phototherapy is the bleaching of the exposed area. The area of skin that remains covered continues to have a yellow touch. Most neonatal units employ standard - length tube light phototherapy. Alternatively, compact fluorescent lamps and LED phototherapy units are now available in India. Such phototherapy units deliver about 200 - foot candles of light to the infant. It also be placed over an incubator.

Length of phototherapy

Just 24 - 48 hours of exposure is generally enough to bring down serum bilirubin levels to a safe unit. Though many authorities insist on giving continuous therapy, there is evidence to the effect that intermittent exposure is almost equally good. The yellow colour of the skin disappears much earlier than the return of serum bilirubin to near normal. Termination of phototherapy is indicated at when serum bilirubin level is less than 11 gm/dl on two consecutive sitting 24 hours apart**.**

Special precaution

During exposure to phototherapy eyes should always be protected with something like a mask. This is essential to nullify the chance of retinal damage. The external genitalia also need protection to prevent gonadal insult in the case of the male neonate.

Contra indications

Congenital erythropoietic porphyria.

Side effects

Loose motions (greenish or dark brown) hyperthermia, dehydration, hypocalcaemia, skin rashes and bronze baby syndrome

Ayurvedic Management

Sanshodhan Chikitsa: The treatment is vitiated *Doshas* are eliminated through *Urdhva* and *Adhomarg* and where the balance is established between *Dosha* and *Dhatus* is known as *Shodhana Chikitsa*. The treatment of choice for *Kamala* is *Mridu - Virechana* as *Virechana* is the best therapeutic procedure for *Pittadosha*. *Kamala Vyadhi* itself is chronic; hence involvement of *Dhatu* is seen. In *Kamala*, *Pitta Dosha* is vitiated by its *Ushna*, *Tikshna Guna* and leads to *Rakta Dhatukshaya*. *Pitta dosha* accumulation occurs due to *drava guna* of *pitta*. In this state, if we give *Tikshna Shodhan*, it leads to vitiation of *Vayu*. So, to eliminate *Sanchit Dosha* and to avoid *Dhatukshaya Mrudu Shodhana* i. e., *Mrudu Virechan* (mild purgation) is beneficial in *Kamala*. Treatment of choice for *Kamala* is *Mridu - Virechaka* as *Virechana* is the best therapeutic procedure for *Pitta Dosha.* [xxi]

Mridu - Virechana: In *Kamala*, *Virechana* should be done by *Tikta* and *Mrudu Dravya*, are instructed by *Charaka* in *Panduroga Chikitsa*: *Gomutra* and *Godugdha* in equal quantity. *Godugdha*, *Eka Anjali Mrudwika prayoga* (8 *pala* nearly about 300 gm.), *Aragwadh Phalmajja* and *Ikshurasa*, *Triphala kwatha* or *Guduchi Swarasa* or *Daruharidra swarasa* or *Nimbpatra swarasa* with *Madhu* in the early hours, *Gomutra Haritaki*, *Trivrita Churna* (one part) and *Sharkara* (two parts). *Amalaki Swarasa* with *Madhu* in the morning. [xxii]

Sanshaman Chikitsa: *Shamana Chikitsa* refers to all the *Ayurvedic* procedures and protocols that reduce, suppress, and eliminate disease symptoms. This form of palliative care pacifies the body by balancing the three *Dosha - Vata, Pitta,* and *Kapha*. *Shamana Chikitsa* often finds useful when the body needs care and improvement but is too weak to handle strong treatments. In case of neonatal jaundice, the child is too weak to handle *Shodhana Chikitsa*, so *Samshamana Chikitsa* is much recommended for neonates.

Herbal Drugs in the management of *Kamala* (neonatal jaundice): -

1) *Bhumyamalaki (Phyllanthus niruri*): - *Bhumyamalaki, "* one of the promising *herbal* drugs used in the Indian system of medicine for various liver disorders is attributable to *Phyllanthus niruri*. [xxiii] A Literature survey reveals that "*Bhumyamalaki"* has been used to treat jaundice, gonorrhoea, frequent menstruation, dysentery, and diabetes. [xxiv] It is also known as "*Pitiriasi, "* or "*Budhatri"* and is used as a household remedy for anaemia, jaundice, tuberculosis, extreme thirst, respiratory disorders etc. in India. [xxv] The antioxidant, hepatoprotective activity of P. niruri may be due to its rich content of flavonoids, tannins, lignans and terpenes, which possess antioxidative traits. One of the earliest in - vitro studies on the antioxidative hepatoprotective role of P. niruri demonstrated that the hexane extract of P. niruri contained lignans such as phyllanthin and hypophyllanthin, which protected rat hepatocytes against carbon tetrachloride and galactosamine - induced hepatotoxicity. [xxvi]

2) *Daruharidra* (*Berberis aristata* DC) - *Daruharidra* has been described by *Acharyas* for *Kamala* and various other diseases. *Daruharidra* has *tikta rasa*, *vipaka katu*, *ruksha guna*, *ushna virya* and *lekhana karma.* [xxvii] which plays a major role in *Bahu - Pitta Kamala*. Berberine present in *Daruharidra* is responsible for hepatoprotective activity. Other constituents present are berberine, promo line, palmatine, oxyacanthine and oxy berberine. [xxviii] According to Ayurveda, *Daruharidra* is a naturally occurring source of berberine, which lowers liver hepatocyte inflammation. It possesses cholagogue, astringent, hepato - stimulant, and hepato - protective qualities. An immunomodulation experiment was carried out on golden hamsters to assess the plant's hepatoprotective potential. The rate of infection in hepatic amoebiasis was found to be reduced by the formulation incorporating *B. aristata*. [xxix] The plant's aqueous methanolic extract has found hepatoprotective properties. [xxx] Hepatobiliary excretion and liver metabolism are regulated by cytochrome p - glycoprotein and P - 450. [xxxi]

3) *Kalmegh* (*Andrographis paniculata*) - *Andrographis paniculata* Nees is an herbaceous plant, commonly known as "King of Bitters", in the family Acanthaceae. *Kalmegh* has *Tikta Rasa, Laghu, Ruksh Guna, Ushna Virya* and *Katu Vipaka*. Major chemical constituents andrographolides, angiographic, andrographolide A, B, C, D, E &F, Andrographolide, pyroxylin A, wogonin, neoandrographolide, pediculicides etc. Pretreatment with a single dose of *Kalamegh* leaf (500 mg/kg, p. o.) or andrographolide (5 ml/kg, p. o.) prevented CCI - induced increase of SGOT and SGPT but decreased liver levels of these enzymes in dogs. Andrographolide, a diterpenoid lactone, was isolated (yield 0.78% w/w) from *A. paniculata* (whole plant). Its LD50 in male mice was 11.46 g/kg, Ip. The antihepatotoxic activity of andrographolide (100 mg/kg, Ip) was compared with 861.33 mg/kg, Ip, of the methanolic extract (equivalent to 100 mg/kg of andrographolide) and 761.33 mg/kg Ip, of the andrographolide - free methanolic extract (equivalent to 861.33 mg/kg of the methanolic extract) of the plant, using CCl4 - intoxicated rats. Biochemical parameters like serum transaminases - - GOT and GPT, serum alkaline phosphatase, serum bilirubin and hepatic triglycerides were estimated to assess the liver function. Overall inhibition of CCl4 - induced increase in the five biochemical parameters was found to be 48.6 per cent (andrographolide), 32.0 per cent (methanolic extract) and 15.0 per cent (andrographolide - free methanolic extract). These biochemical observations were supplemented by histopathological examination of the liver slices. Further, andrographolide (100 mg/kg, Ip) was found to normalize completely the CCl4 - induced increase in the pentobarbitone - induced sleep time of mice. The results suggest that andrographolide is the major active antihepatotoxic principle present in *A. paniculata*. [xxxii]

4) *Haritaki (Terminalia chebula*): *Haritaki* is the preferred medicine for gastrointestinal and liver diseases. It has been traditionally used to treat indigestion with its liver - protective action. The ethanolic extract of *Terminalia chebula* fruits, containing a combination of chebulic acid (CA) and its minor isomer, neo chebulic acid, demonstrated significant hepatoprotective action, indicating its pharmacological activity.

Drug combinations of neonatal jaundice –

1) *Kamlanashak Yoga* - According to *Acharya Charaka*, the patient suffering from jaundice may lick the powder

prepared of equal quantity of iron powder, chebulic myrobalan and turmeric, with honey and *ghee,* or the powder of chebulic myrobalan with jaggery and honey. [xxxiii]

2) *Triphala Kashaya* - According to *Acharya Charak*, the patient suffering from jaundice should take early in the morning the cold infusion of the *Triphala* mixed with honey. [xxxiv] A study on *Triphala Kashaya* Showed that, When the Phototherapy & *Triphala Kashaya* with *Madhu* was given for 6 consecutive days in selected cases, it was found that it is very effective for the treatment of *Bahu Pitta Kamala* (jaundice) of neonates. The effect of only Phototherapy for 6 consecutive days was lower in comparison with the cases who received the Phototherapy & *Triphala Kashaya* with *Madhu*. The cases of both groups have their significant effect; however, the effect of trial group is higher than control group because of *yakritotejak srotoshodhak* effect of *Triphala. Triphala* decreases total serum bilirubin and do not make it to rise in later days within treatment. This decrease is may be due to suppressed enterohepatic recirculation. Hypolipidemic activity of *Triphala* may be useful as the increased lipids causes depletion of Albumin bound bilirubin. [xxxv]

3) *Punarnava Mandoor* - *Punarnava Mandoor* is an *ayurvedic* formulation mentioned in various *ayurvedic Samhitas* and texts like *Charak Samhita, Bhaishajyaratnavali*, *Bhavprakasha* and *Sidhayog Sangraha* etc. It is rich in iron hence *Acharya Charaka* mentioned *Punarnava mandoor* under '*Panduroga chikitsa Adhyaya*. The role of materials of *Punarnava Mandur* is as Follows: *Punarnava* is found in India and it is a valuable medicinal plant. It is an excellent diuretic, anti - inflammatory. *Trivrut* roots contain the glycosidic resin, Turpethein and Turpethin. It shows anti - inflammatory, antimicrobial, hepatoprotective and laxative & purgative properties. *Sunthi* is pungent in taste, hot potency and post digestive effect is *madhura*. It is useful in relieving anorexia, improves digestive strength, balances *kapha* and *vata* and shows anti - inflammatory action. *Vidanga* is anti - parasitic herb. *Vidanga* is a best drug of worm infestation. It also helps to detoxify blood hence useful in skin diseases. *Devdaru* is useful in skin diseases (*kushtshara),* in worm infestation and respiratory diseases. *Chitrak* is powerful digestive herb. It is hot in potency due its hotness; it balances *Vata* and *Kapha Doshas*. It improves digestive strength act as *Grahi* (absorbent) and it is useful in the treatment of liver & kidney diseases. *Kushth* pacifies *Kapha* & *Vata Doshas*. As per *acharya Charaka* this herb is *Sukrashodhana (*correct sperm morphology), *Lekhaniya (*fat reducing activity) *Haridra* is bitter in test with hot potency. It acts against vitiated *kapha* & *Pitta Doshas*. It is useful in anaemia, skin diseases, oedema, diabetes etc. *Triphala* is *ayurvedic herbal Rasayana* formula consisting of equal part of three plants *Amlaki, Haritaki, Bibhitaki*. *Triphala* is a phytomedicine that promote health, immunity & longevity. It shows antibacterial & antiviral properties. As per *Acharya Charaka Danti* is *Bhedaniya (*Purgative). *Danti* is a blood purifier and its roots & seeds paste used to reduce oedema and pain. *Chavya* - its root and fruit are useful in treating indigestion, abdominal pain and anorexia. *Kutaja* shows *arshoghna* (treat hemorrhoids), *Kandughna* (relieve itching), *stanyashodhana (*cleansing, & detoxifying breast milk). *Pippalimula* significantly shows hepatoprotective and antioxidant properties. It is mainly indicated in respiratory diseases. *Musta* is very useful ayurvedic herb for promoting healthy & regular menstruation, relieves fever with burning sensation and gastritis. *Mandur bhasma* is an ayurvedic iron formulation. Chemically it is ferric oxide. It is the drug of choice in iron deficiency anaemia. *Gomutra* - As per *Acharya Charaka, Gomutra* is slightly *Madhura (*sweet), along with *katu rasa (*pungent), it also alleviates *Doshas,* it is bactericidal and it cures *Kushta* & *Kandu.* [xxxvi] *Punarnava Mandur* act as hepatoprotective and induces regeneration of liver cells. In fatty liver diseases it reduces fat accumulation in liver cells, which help to treat fatty liver and improves the liver functions. [xxxvii]

Do's and Don'ts to mother whose child suffering from Neonatal Jaundice[xxxviii]

Do's (Pathya):
Vamana, Virechana, more than one year old granule like barley, wheat, *yush* of pulses like *mung, arhar*, lentils, meat juice of Animals or birds living in forest area, raw banana fruit, *jeevanti, talmakhana, Matshyakshi*, *Giloe, Punarnava, Choulai,* brinjal both type of garlic (normal and *putiya),* Riped Mango, *Harad, Bimbi (kundru), Singhi Machhali* (A type of fish), *Gou mutra*, *Anwala, Mattha, Loha bhasma, Mandoor bhasma, Makkhan, Ghee, Haridra, Nagakeshar,* all type of *Kashaya Ras* dominant medicine and Aganikarma therapy etc.

Don'ts (Apathya):
Shiravedh, Dhoomapana, to stop *Vega - vidharan (*natural urges), *Maithuna, Swedan,* all type of *Patra sakh*, *Simbi dhanya* Exessive intake of water, *Tila*, betel, mustard, alcohol, eating mud, day sleeping, all type of salt, consumption of sharp alkali, all type of sour food like lemon, pickles, tamarind etc, contaminated water, *Virudha ahara, Vidhahi ahara,* Heavy meal, etc.

3. Discussion

Jaundice is a common illness that affects many new - borns worldwide. It is caused by elevated levels of bilirubin in the blood, which lead to the distinctive yellow colour of the skin, eyes and mucus membrane. This evolution focusses on the ayurvedic perspective of the disease, including its causes, treatment and potential integration with modern medical procedure. From ayurvedic view of point, neonatal jaundice can be linked to Pitta dushti, a condition where the new - born's Physiological process and the mother's milk are affected by an imbalance in the doshas. This imbalance results in elevated unconjugated bilirubin level. For *Ayurvedic* practitioners, understanding these differences is as crucial as it provides a framework for diagnosis and treating the illness by emphasizing the interaction of dosha, dhatu, mala and srotas.

Phototherapy is the standred approach in modern medical science and while it is effective. Its own drawback. the necessitates the use of alternate approach, such as *Ayurvedic* formulations, to prevent bilirubin level from rising and avoid serious side effect like kernicterus. The principal of *ayurvedic* treatment of *kamala* as described in ancient text like the *Charaka Samhita*, *Sanshodhan Chikitsa* (focus on detoxification) and *Shamana Chikitsa (*pacification). This

involves using customized herbal treatment and dietary adjustment to balance the doshas involved. These *Ayurvedic* methods are supported by modern research that explain the physiological and biochemical reasons for newborn jaundice. Hyperbilirubinemia in neonates is caused by various important factor, including enzyme deficiencies, increased enterohepatic circulation and immature liver functions. Premature baby is particularly susceptible due to their underdeveloped metabolic pathways.

The management of newborn jaundice could potentially be improved by combining modern medical procedures with *Ayurvedic* principles. incorporating *Ayurvedic* dietary and lifestyle modifications may assist in the clearance of bilirubin and improves liver function in infants. Additionally, the use of hepatoprotective herbal formulation as supplementary treatment may reduce the need for phototherapy.

To effectively evaluate the efficacy of *Ayurvedic* treatment of newborn jaundice, further investigation is required. This could involve conducting clinically trials that compare integrative and traditional methods, focusing on long term result, safety and efficacy. such review could provide strong justification for integrating *Ayurvedic* medicine in to standard neonatal care, creating a comprehensive approach to treating this common condition.

4. Conclusion

The concept of neonatal hyperbilirubinemia in *Ayurveda* can be understood in the context of *Pittaja Stanya Dushti* along with the physiological variations in the new - borns leading to the raised level of unconjugated bilirubin. Therefore, the patho - physiology should be known by a paediatrician in Ayurveda based on the involvement of *Dosha*, *Dhatu, Mala* and *Srotas*. Many of the Ayurvedic Formulation mentioned as above could be proven as effective, cheap and untoward free treatment of neonatal hyperbilirubinemia.

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