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A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFECT OF PUNARNAVA MOOL CHURNA AND BHUMYAMALAKI PANCHANGA CHURNA IN PHYSIOLOGICAL JAUNDICE

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ABSTRACT

Neonatal jaundice is one of the most common problem found in infants. The present study being exploratory in nature reports the intervention of Punarnava (*Boerhavia diffusa*) and Bhumyamalaki (*Phyllanthus niruri*) for managing physiological jaundice. It can be correlated with Koshtha-ashrita Kamala of Ayurvedic texts. In the present study 90 healthy newborns with yellowish tinge and increased Total serum bilirubin (TSB) were selected and randomly divided into 3 groups (30 patients in each group), out of which 8 patients (4 patients from each group B and C) were dropped out. In Group A, patients were treated with Punarnava mool churna and in group B patients were treated with Bhumyamalaki panchanga churna while group C was untreated group. Both drugs were given in dose of 60 mg/kg/day, bid, orally after feed with madhu for 15 days. There were 3 follow ups, 1st after 7 days, 2nd after 15 days and 3rd after 30 days, from the starting of trail. Assessment of the effect of the therapy has been done on the basis of the subjective criteria (according to Kramer's rule) and objective criteria (according to laboratory investigation). Statistical analysis of all three groups show the highly significant results ($P < 0.001$) however group A shows more significant results than group B and group C and while group B shows more significant results than group C.

Keywords: Physiological jaundice, Koshtha-ashrita kamala, Total serum bilirubin.

INTRODUCTION

Neonatal jaundice is one of the many entities which may lead to severe morbidity or mortality. Physiological jaundice, although is present in 60 % of term infants and 80 % of preterm infants, usually it starts on 3rd day and subsides within a week but sometimes when exceeding the limits both quantitatively and qualitatively may cause concern as it may ensure various complications leading to morbid state needing treatment^{1,2}. Ayurvedic texts did not mention Navajata Shishu Kamala separately as a chapter. However, scattered references are available in the literature. Ayurvedic texts especially Kashyapa Samhita has ample description regarding Navajata Shishu Kamala³. Acharya Kashyapa in "Vedanadhyaya" has described signs and symptoms of Pandu and Kamala⁴. He described yellowish discolouration of eyes, nails, mukha, vita and mutra along with lethargy and refusal of feed as symptoms by which one may suspect Kamala also in neonates. Physiological jaundice is caused due to excessive destruction of RBCs and Ayurveda has considered pitta as a mala of rakta and accumulation of mala may lead to Kamala. So it can be correlated with Koshtha-ashrita Kamala of Ayurvedic texts⁵. According to Acharya Kashyapa, Revati is one Graha that causes Kamala while describing clinical features of child seized with Jataharini, concept of Navajata Shishu Kamala may be inferred⁶.

Aims and Objectives

- To have a conceptual study of "Physiological jaundice" based on both Ayurvedic and Modern literatures.

- To assess the effects of Punarnava mool churna and Bhumyamalaki panchanga churna in the management of Physiological jaundice.
- To assess the clinical safety of both drugs in the patients of Physiological jaundice.
- To compare the effect of both drugs with each other and with group C.
- To study the complications, if any, during the course of the treatment.

MATERIALS AND METHODS

Selection of the patients

After obtaining permission from Institutional Ethics Committee, 90 Patients were selected from IPD/OPD of Department of Kaumarabhritya-Balroga, R.G.G.P.G. Ayu. Hospital Paprola, Himachal Pradesh, India. Patients fulfilling the diagnostic criteria were included in the present study.

Diagnostic criteria

Diagnosis was done on the basis of following:

- History and symptomatology of physiological jaundice.
- By assessing the patients physically, according to Kramer's rule.
- Increased Total serum bilirubin according to laboratory Investigations.

Inclusion criteria

- Newborn of either sex aged between 2-5 days having yellowish tinge.

- Newborn who developed Jaundice more than 24 hours and less than 6 days.
- Newborn with total serum bilirubin > 5 mg/dl but < 12 mg/dl in preterm and <15 mg/dl in term babies.
- Willing parents of newborn babies to participate in the trial.

Exclusion criteria

- Newborn of either sex aged less than 2 days and greater than 5 days.
- Newborn who developed icterus within 24 hours and more than 5 days.

- Newborn with serum bilirubin >12 mg/dl in preterm and >15 mg/dl in term babies.
- Newborn with any systemic congenital abnormalities (Blood group incompatibility etc. and infectious diseases).
- Newborn who developed hypersensitivity in between the trial duration.
- Unwilling parents of newborn babies to participate in the trial.

Protocol of the study

After obtaining the consent from the Parent/Guardian a detailed proforma has been filled to note down all the details of the patients and the disease.

Grouping of patients

Patients were randomly divided in to 3 groups-

	Group – A (treated with Punarnava mool churna)	Group - B (treated with Bhumyamalaki panchanga churna)	Group - C (without any type of drugs)
Dose	60 mg/kg/day	60 mg/kg/day	No treatment
Route of administration	Oral	Oral	
Time of administration	Twice a day after feed	Twice a day after feed	
Anupana	Madhu	Madhu	
Duration	15days	15 days	

Follow up

There were three follow ups, first after 7 days, second after 15 days and third after 30 days from the starting of the trial. At first and last follow up, only physical assessment was done while in second follow up laboratory investigations were also done.

Assessment Criteria

Subjective Criteria

It has been based on physical examination of the baby by blanching the skin for assessing the level of the yellowish

tinge. By following this grades/scores were accorded as per the Kramer's rule.

Objective Criteria

It was based on laboratory investigations -

- Hb g %
- Blood group with Rh factor
- S.Bilirubin – total and direct
- S.G.O.T
- S.G.P.T.
- S. Creatinine
- Blood urea

Scoring pattern adopted

S. No.	Subjective criteria	Objective criteria		Grades
		in term baby	in preterm baby	
i.	No Yellowish tinge	TSB - < 4 mg/dl	TSB - <4 mg/dl	Grade 0
ii.	Yellowish tinge in Zone 1 (up to neck)	TSB - 4 - 6 mg/dl	TSB - 4 -6 mg/dl	Grade I
iii.	Yellowish tinge in Zone 2 (up to umbilicus)	TSB - 6 - 8 mg/dl	TSB - 6 - 8 mg/dl	Grade II
iv.	Yellowish tinge in Zone 3 (up to knee)	TSB - 8 - 12 mg/dl	TSB - 8 - 10 mg/dl	Grade III
v.	Yellowish tinge in Zone 4 (up to arms and legs)	TSB -12 - 15 mg/dl	TSB - 10 - 12 mg/dl	Grade IV
vi.	Yellowish tinge in Zone 5 (up to palms and soles)	TSB - > 15 mg/dl	TSB - > 12 mg/dl	Grade V

Patients were assessed according to change in their grades for the improvement in the subjective and objective criteria before and after the treatment.

Assessment of improvement

a. Complete relief -

- Complete relief in the initial chief complaints of the patients.
- Normalization of the total S. bilirubin level.

b. Marked relief -

- More than 75 % relief in initial chief complaints.
- Marked decrease in total S. bilirubin level.

c. Moderate relief -

- More than 50 % relief in initial chief complaints.
- Moderate decrease in total S. bilirubin level.

d. Mild relief -

- More than 25 % relief in initial chief complaints.
- Mild decrease in total S. bilirubin level.

e. No relief -

- No changes in complaints and total S. bilirubin level.

OBSERVATIONS AND RESULTS

Clinical observations are cited below in tables for 30 patients in group A, 26 patients in Group B and 26

patients in group C who completed the treatment for entire duration.

Table 1: Effect on yellowish tinge in Group A

Visits	n	Mean Score		D	% relief	SD $\pm$	SE $\pm$	't'	P	Remark
		BT	AT							
FU ₀ vs FU ₁	30	2.80	0.57	2.23	79.76	1.17	0.21	10.50	0.000	< 0.001
FU ₁ vs FU ₂	30	0.57	0.00	0.57	100	0.63	0.11	4.96	0.000	< 0.001
FU ₀ vs FU ₂	30	2.80	0.00	2.80	100	1.19	0.22	12.93	0.000	< 0.001

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up

Table 2: Effect on yellowish tinge in Group B

Visits	n	Mean Score		D	% relief	SD $\pm$	SE $\pm$	't'	P	Remark
		BT	AT							
FU ₀ vs FU ₁	26	2.58	0.65	1.92	74.63	0.74	0.15	13.18	0.000	< 0.001
FU ₁ vs FU ₂	26	0.65	0.15	0.50	76.48	0.58	0.11	4.37	0.000	< 0.001
FU ₀ vs FU ₂	26	2.58	0.15	2.42	94.03	0.70	0.14	17.58	0.000	< 0.001

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up

Table 3: Effect on yellowish tinge in Group C

Visits	n	Mean Score		D	% relief	SD $\pm$	SE $\pm$	't'	P	Remark
		BT	AT							
FU ₀ vs FU ₁	26	2.96	2.23	0.73	24.68	0.78	0.15	4.79	0.00	< 0.001
FU ₁ vs FU ₂	26	2.23	1.08	1.15	51.72	0.61	0.12	9.60	0.00	< 0.001
FU ₀ vs FU ₂	26	2.96	1.08	1.88	63.64	0.95	0.19	10.09	0.00	< 0.001

Table 4: Effect on TSB level

Groups	n	Mean Score		D	% relief	SD $\pm$	SE $\pm$	't'	P	Remarks
		BT	AT							
Group A	30	10.81	2.69	8.12	75.08	2.87	0.52	15.52	0.00	< 0.001
Group B	26	10.00	2.66	7.35	73.43	2.99	0.59	12.51	0.00	< 0.001
Group C	26	10.65	5.28	5.37	50.43	2.12	0.42	12.94	0.00	< 0.001

BT: Before Treatment; AT: After Treatment

Table 5: Effect on Haematological Values in Group A

Values	n	Mean Score		D	% Relief	SD $\pm$	SE $\pm$	't'	P	Remark
		BT	AT							
Hb	30	15.51	15.59	0.07	0.47	0.28	0.05	1.44	0.16	> 0.05
SGOT	30	32.40	32.07	0.33	1.03	0.99	0.18	1.84	0.08	> 0.05
SGPT	30	27.00	26.67	0.33	1.23	0.96	0.18	1.90	0.07	> 0.05
S. Creatinine	30	0.62	0.59	0.03	4.86	0.11	0.02	1.56	0.13	> 0.05
Blood Urea	30	21.63	21.50	0.13	0.62	0.78	0.14	0.94	0.35	> 0.05

BT: Before Treatment; AT: After Treatment

Table 6: Effect on Haematological Values in Group B

Values	n	Mean Score		d	% Relief	SD $\pm$	SE $\pm$	't'	P	Remark
		BT	AT							
Hb	26	15.39	15.45	0.06	0.40	0.20	0.03	1.87	0.07	> 0.05
SGOT	26	32.65	32.12	0.54	1.65	1.39	0.33	1.97	0.10	> 0.05
SGPT	26	27.81	27.35	0.46	1.66	1.27	0.54	1.85	0.07	> 0.05
S. Creatinine	26	0.67	0.69	0.02	2.87	0.06	0.01	1.73	0.17	> 0.05
Blood Urea	26	24.38	24.77	0.39	1.58	1.02	0.20	1.92	0.56	> 0.05

BT: Before Treatment; AT: After Treatment

Table 7: Effect on Haematological Values in Group C

Values	n	Mean Score		D	% Relief	SD $\pm$	SE $\pm$	't'	P	Remark
		BT	AT							
Hb	26	15.24	15.29	0.05	0.35	0.20	0.04	1.36	0.19	> 0.05
SGOT	26	35.77	35.19	0.58	1.61	1.70	0.33	1.73	0.10	> 0.05
SGPT	26	31.31	30.31	1.00	3.19	2.73	0.53	1.87	0.07	> 0.05
S. Creatinine	26	0.66	0.64	0.02	2.91	0.07	0.01	1.41	0.17	> 0.05
Blood Urea	26	27.88	27.77	0.12	0.41	0.99	0.19	0.59	0.56	> 0.05

BT: Before Treatment; AT: After Treatment

According to effect on yellowish tinge in FU₁ (1st follow up), the percentage relief was 79.76 % in group A, 74.63 % in group B and 24.68 % in group C which is statistically highly significant ($p < 0.001$). While in FU₂ (2nd follow up) from FU₁ it was 100 % in group A, 76.48 % in group B and 51.72 % in group C which are also statistically highly significant ($p < 0.001$). After trial, the percentage relief were 100 % in group A, 94.03 % in group B and 63.64 % in group C which is also statistically

highly significant ($p < 0.001$). The percentage improvements in TSB level were 75.08 % in group A, 73.43 % in group B and 50.43 % in group C. All these results were statistically highly significant ($p < 0.001$). All the haematological and biochemical parameters in group A, group B and group C were within normal limits in both before and after the treatment and statistically insignificant changes ($p > 0.05$) were observed in these values after the completion of therapy.

Comparative evaluation

Table 8: Intergroup (Group A vs Group B) comparison over yellowish tinge

N		Visits	% Relief		% relief Difference		't'	p		Remarks
Group A	Group B		Group A	Group B						
30	26	FU ₀ vsFU ₁	79.76	74.63	5.13	BT	0.87	0.39	> 0.05	NS
						AT	0.47	0.64	> 0.05	NS
30	26	FU ₁ vs FU ₂	100	76.48	23.52	BT	0.47	0.64	> 0.05	NS
						AT	2.13	0.04	< 0.05	S
30	26	FU ₀ vs FU ₂	100	94.03	5.97	BT	0.87	0.39	> 0.05	NS
						AT	2.13	0.04	< 0.05	S

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant; S: Significant;

Table 9: Intergroup (Group B vs Group C) comparison over yellowish tinge

N		Visits	% Relief		% relief Difference		't'	p		Remarks
Group B	Group C		Group B	Group C						
26	26	FU ₀ vs FU ₁	74.63	24.68	49.95	BT	1.53	0.13	> 0.05	NS
						AT	6.48	0.00	< 0.001	HS
26	26	FU ₁ vs FU ₂	76.48	51.72	24.76	BT	6.48	0.00	< 0.001	HS
						AT	6.03	0.00	< 0.001	HS
26	26	FU ₀ vs FU ₂	94.03	63.64	30.39	BT	1.53	0.13	> 0.05	NS
						AT	6.03	0.00	< 0.001	HS

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant; HS: Highly Significant

Table 10: Intergroup (Group A vs Group C) comparison over yellowish tinge

N		Visits	% Relief		% relief Difference		't'	p		Remarks
Group A	Group C		Group A	Group C						
30	26	FU ₀ vs FU ₁	79.76	24.68	55.08	BT	0.53	0.61	> 0.05	NS
						AT	7.37	0.00	< 0.001	HS
30	26	FU ₁ vs FU ₂	100	51.72	48.28	BT	7.37	0.00	< 0.001	HS
						AT	7.98	0.00	< 0.001	HS
30	26	FU ₀ vs FU ₂	100	63.64	36.36	BT	0.53	0.61	> 0.05	NS
						AT	7.98	0.00	< 0.001	HS

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant; HS: Highly Significant

Table 11: Intergroup (Group A vs Group B vs Group C) comparison over yellowish tinge

N			visits	% Relief				'F'	P		Remarks
Group A	Group B	Group C		Group A	Group B	Group C					
30	26	26	FU ₀ vs FU ₁	79.76	74.63	24.68	BT	0.93	0.41	> 0.05	NS
							AT	37.16	0.00	< 0.001	HS
30	26	26	FU ₁ vs FU ₂	100	76.48	51.72	BT	37.16	0.41	> 0.05	NS
							AT	47.41	0.00	< 0.001	HS
30	26	26	FU ₀ vs FU ₂	100	94.03	63.64	BT	0.93	0.00	< 0.001	HS
							AT	47.41	0.00	< 0.001	HS

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant; HS: Highly Significant

Table 12: Intergroup (Group A vs Group B) comparison over TSB

N		Based on	% Relief		% relief Difference		't'	P		Remarks
Group A	Group B		Group A	Group B						
30	26	TSB	75.08	73.43	1.65	BT	1.06	0.29	> 0.05	NS
						AT	0.10	0.92	> 0.05	NS

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant

Table 13: Intergroup (Group B vs Group C) comparison over TSB

N		Based on	% Relief		% relief Difference		't'	p		Remarks
Group B	Group C		Group B	Group C						
30	26	TSB	73.43	50.43	23.00	BT	0.93	0.36	> 0.05	NS
						AT	7.73	0.00	< 0.001	HS

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant; HS: Highly Significant

Table 14: Intergroup (Group A vs Group C) comparison over TSB

N		Based on	% Relief		% relief Difference		't'			Remarks
Group A	Group C		Group A	Group C						
30	26	TSB	75.08	50.43	24.65	BT	0.22	0.83	> 0.05	NS
						AT	8.02	0.00	< 0.001	HS

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant; HS: Highly Significant

Table 15: Intergroup (Group A vs Group B vs Group C) comparison over TSB

N			Based on	% Relief				'F'	p		Remarks
Group A	Group B	Group C		Group A	Group B	Group C					
30	26	26	TSB	75.08	73.43	50.43	BT	0.67	0.51	> 0.05	NS
							AT	37.32	0.00	< 0.001	HS

BT: Before Treatment; AT: After Treatment; FU₀: First reading; FU₁: First follow up; FU₂: Second follow up; NS: Not Significant; HS: Highly Significant

According to yellowish tinge, in FU₁ the relief difference between group A and group B was 5.13 % which is insignificant statistically ($p > 0.05$) and between group B and group C it was 49.95 % which is highly significant statistically ($p < 0.001$) while between group A and group C it was 55.08 % which is also highly significant statistically ($p < 0.001$). In FU₂ the relief difference between group A and group B was 23.52 % which is significant statistically ($p < 0.05$), between group B and group C it was 24.76 % while between group A and group C it was 48.28 %, both of these are highly significant statistically ($p < 0.001$). In FU₂ from the starting of the trial, the relief difference between group A and group B

was 5.97 % which is significant statistically ($p < 0.05$), between group B and group C it was 30.39 % while between group A and group C it was 36.36 %, both of these are highly significant statistically ($p < 0.001$). According to TSB level, after trial the relief difference between group A and group B was 1.65 % which is insignificant statistically ($p > 0.05$), between group B and group C it was 23 % which is highly significant statistically ($p < 0.001$) while between group A and group C it was 24.65 % which is also highly significant statistically ($p < 0.001$). When comparing all three groups on the basis of yellowish tinge as well as TSB level, all show statistically highly significant results.

Overall effect of therapy

Table 16: Assessment on the basis of yellowish tinge and TSB

Results	Group A (Trial Group)		Group B (Trial Group)		Group C (Control Group)	
	No. of Patients	%	No. of Patients	%	No. of Patients	age
Completely Improved	25	83.33	18	69.23	02	7.70
Markedly Improved	05	16.67	06	23.08	07	26.92
Moderately improved	0	0	02	7.70	12	46.15
Mildly Improved	0	0	0	0	05	19.23
No improvement	0	0	0	0	0	0

About 25 patients in group A (83.33 %), 18 (69.23 %) patients in group B and 2 (7.70 %) in group C were completely improved. Though, in group B 14.10 % less patients were completely improved than group A and 61.53 % more patients were completely improved than group C while in group A 75.63 % more patients got complete improvement than group C. Only 5 patients (16.67 %) were markedly improved in group A while 6 patients (23.08 %) were markedly improved in group B and 7 (26.92 %) patients were markedly improved in group C. This shows that 6.41 % more patients in group B were markedly improved than group A while 3.84 % less patients were markedly improved than group C and 10.25 % more patients in group C were markedly improved than

group A. 2 patients (7.70) in group B were moderately improved while 12 (46.15 %) patients were moderately improved in group C. The difference between these two groups was 38.45 %. Only in group C mildly improved patients were 5 (19.23 %).

DISCUSSION

Mode of Action of the Drugs

Drugs perform their action with the properties like Rasa, Guna, Veerya, Vipaka and Prabhava. Kamala is a Pittaja vyadhi with involvement of Dushyas Rakta and mamsa. Koshtha and Shakha are main Adhishtana. Raktavaha, Rasavaha, Annavaha and Purishvaha are main srotas which are involved in it. Srotodushti is seen in the form of

Atipravriti, Sanga and Vimargamana. Physiological jaundice can be considered as Koshtha-ashrita Kamala in Ayurvedic texts. According to Acharya Charaka, principle of the treatment for koshtha-ashrita kamala is –

Samshodhyo MrdubhihTiktaih Kamale tu Virechanam”⁷

It shows that treatment of Kamala is Samshodhana with Mridu virechana by the dravyas of Tikta rasa. But in newborn, virechana is contraindicated, although, newborn already has increased number of frequency of stool and urine naturally. Here virechana occurs in the sense of Pitta; so drugs cause pitta-rechana not purgation. Both drugs have virechana properties as well as other properties to treat Kamala. The probable mode of action of the drugs may be explained as follows^{8,9}

Pitta-Virechana Karma

In physiological Jaundice, Pitta is formed as mala of Rakta due to breakdown of RBCs and due to immaturity of organs and systems; this mala (pitta) causes Srotodushti by sanga, atipravriti and vimargamana. Both drugs, by the action of Yakriduttejaka karma (Liver stimulation) cause fast pitta-rechana from liver and further cause rapid reabsorption of pitta in gut and from bloodstream and then by mutra virechana karma cause excretion of pitta through urine.

Action by Rasa

Both drugs have madhura, tikta and kashaya rasa which belong to Saumyavarga hence provide Sheetata which is antagonistic to pitta and cause pitta-shamana.

By Madhura rasa (Jala + Prithivi)

Both drugs cause Snehana, Tarpana (mainly Rakta dhatu cause Rakta vardhana), Vatanulomana, Pitta-shamana, Varnaya, Mriduta in the body by madhura rasa. They also remove toxic bilirubin (Vishghna) from the body by their mutrala effect. But Punarnava is predominant in madhura rasa, so more action is done by Punarnava in comparison to Bhumyamalaki.

By Tikta Rasa (Vayu + Akasha)

By Tikta rasa, both drugs cause removal of Khavaigunya, Sroto-shodhana (So inhibit sanga of the srotas and increase flow of the secretion in the body, so that it stimulate liver and gallbladder to secrete Pitta rapidly and further remove toxins from the body), Ama-Pachana, Deepana, Rochana, Rakta shodhana, Dahaprashamana, srava-shoshana (i.e. Pitta absorbed from gut and circulation), Pitta-Kapha-shamana and remove toxins from the body (Vishghna). Bhumyamalaki is predominant in tikta rasa, so more action is done by Bhumyamalaki in comparison to Punarnava.

By Kashaya Rasa (Vayu + Prithivi)

By Kashaya rasa, both drugs help to recover the colour of the body from alteration, Kapha-Pitta-Rakta Prashamana, Raktasandhana and Mutrasangrahana. Kashaya rasa also helps in Srava – shoshana, Kledo-shoshana and removal of toxins from the body.

Action by Guna

Both drugs have Laghu (Vayu, Agni, Akash) and Ruksha guna (Vayu, Agni) (Prithivi). Due to laghu guna, drugs cause Deepan, Kapha-shamana, Vatanulomana, Srotoshodhana and decrease in mala. Laghu guna made the drugs to digest easily. Rukshaguna also causes Kapha-shamana and Vatanulomana. It also helps in Mala-shoshana (Dravansh-shoshana) which further cause decrease in toxins and reabsorption of secretions in the body.

Action by Veerya

Ushna veerya

Punarnava has Ushna veerya (Agni) and by which punarnava causes Kapha-Vata shaman. Rakta has predominance of Agni and Jala so it is considered as Anushna-sheeta, Punarnava by its Ushna veerya (Agnaya property) causes increase in Rakta-Karna (Haematinic action).

Sheetaveerya

Bhumyamalaki has sheeta veerya (Prithivi and Jala). By which bhumyamalaki causes Pitta shaman, Vatanulomana and Dhatu poshana (mainly Rakta dhatu; due to its jaliya and parthiva properties increases rakta rasa).

Action by Vipaka

Both drugs have madhura vipaka cause Pittashaman, Dhatu poshana (mainly Rata dhatu), easily remove vata, mutra, mala, immunomodulation and antioxidant effect. It also increases the action of drugs which was done by madhura rasa.

Doshaghna

Punarnava is tridosha-shamaka while Bhumyamalaki is kapha-Pitta shamaka.

Karma

Both drugs have Deepana, Pachana, Anulomana, Yakriduttejaka, Raktavardhaka, Raktashodhaka, Vishaghna and Pitta-rechaka karma. Punarnava has main chemicals like Punarnavine-1, 2, Punarnavoside, Sitosterol etc., may produce Diuresis and Choleric activity. By choleric action, drug stimulates liver and gallbladder to remove toxins (bilirubin which can be considered as mala of rakta i.e. Pitta), so promote the clearance of liver and gallbladder. These toxins are further removed from the body by its diuretic activity. So the drug acts by increasing the reabsorption of the unconjugated bilirubin in gut and from circulation. Punarnavine also enhances RBCs and WBCs count. It also protects and regenerates the hepatocytes thus improve the liver functions. Rotenoid, steroids and flavones etc. isolated from plant, have antioxidant activity and promote the balance of globulin and albumin. These chemicals also exhibit the lowering of serum bilirubin in the body. Bhumyamalaki also has various chemicals, produce choleric activity, by which it stimulates the liver to remove the toxins which further reabsorbed in blood stream and filtered by the kidneys and then by the diuretic activity remove the toxins from the body. It has flavones, lignans, steroids, Alkaloids etc., produce

antioxidant activity which improve function and protection of the liver and GIT flora. Both drugs were given with honey which itself has good effects on kamala as per classics. It is one of the best suggested vehicles that have yogavahi property which does not interfere with drug property and just transports it. The studies indicate its power to enhance the drug action which is the best quality for anupana.

CONCLUSION

In the present research work on the basis of facts, observations and results of drugs and clinical studies, the following conclusions are made:

Physiological jaundice is very common and benign problem in newborns, although, it is self-limiting. It is visible on 2nd -3rd day of age with peak level on 4th -5th day of life and disappears by 14th day of life. In preterm babies, it manifest earlier but never before 24 hours of age and maximum intensity reach on 5th or 6th day and it may persist up to 14th day. It is more common in male baby than female baby (4:1) and infants of 37-38 weeks of gestational age. After birth, foetal Hb (with 2 α and 2 γ chains) convert into adult Hb (with 2 α and 2 β chains) which results in shorter life span (90 days) of foetal RBCs causing haemolysis and bilirubin production but due to immaturity of organs and system in neonate, produce increase level of serum unconjugated bilirubin called as physiological jaundice. About 1 g Hb yield 35 mg of bilirubin. It can be correlated with Koshtha-ashrita Kamala of Ayurvedic texts. It is a pittaja disease as mala (pitta) of rakta can be equated with bilirubin. Age group of mothers < 25 years shows more predominance to develop physiological jaundice in neonates. Breast fed infants have predominance of physiological jaundice. Less as well as high, both amount of breast milk may cause neonatal jaundice. Insufficient intake of breast milk results in infrequent bowel movement causes excretion of bilirubin relatively (retained meconium has 1 mg/dl bilirubin). High amount of breast milk causes presence of

an unusual metabolite of progesterone (Pregnane-3- α -20- β -diol) in the circulation of infant, inhibits UDPGA and produces breast milk jaundice (BMJ). There is cephalo-caudal progression of yellowish tinge in the jaundiced body whereas disappearance is in caudo-cephalic pattern. Though physiological jaundice is safe but it can be a serious condition when untreated and may produce Kernicterus. From the study, it can be concluded that both drugs are potent enough to reduce serum bilirubin level in neonates without any side effect; however, Punarnava is quite more effective than Bhumyamalaki.

REFERENCES

1. Newborn infants, chapter 7th, Ghai OP, Paul Vinod, Bagga Arvind, Essential Pediatrics, 7th Edition, CBC Publishers and Distributors Pvt Ltd, New Delhi; 2009. p. 147-151.
2. Jaundice, chapter 18th, Singh M, Care of the newborn, 6th edition, Sagar Publication, 72 Janapath New Delhi; 1999. p. 239-255.
3. Sutrasthana 19, Lankara Shri Satyapala Bhishaga Acharya, Hindi commentary, Kashyapa Samhita by Vriddha Jivaka, 2nd edition, Chaukhambha Sanskrit Sansthan, Varanasi; 1976. p. 9.
4. Sutrasthana 25/34-35, Lankara Shri Satyapala Bhishaga Acharya, Hindi commentary, Kashyapa Samhita by Vriddha Jivaka, 2nd edition, Chaukhambha Sanskrit Sansthan, Varanasi; 1976.
5. Chikitsa sthana 16/34-38, Commentary by Brahmananda Tripathi, Charaka Samhita, reprint edition, Vol.2, Chaukhambha Surbharti Prakashana, Varanasi; 1991.
6. Kalpsthana, Revati Kalpadhyaya/73-74, Lankara Shri Satyapala Bhishaga Acharya, Hindi commentary, Kashyapa Samhita by Vriddha Jivaka, 2nd edition, Chaukhambha Sanskrit Sansthan, Varanasi; 1976.
7. Chikitsa sthana 16/40, Commentary by Brahmananda Tripathi, Charaka Samhita, reprint edition, Vol.2, Chaukhambha Surbharti Prakashana, Varanasi; 1991.
8. Database on Medicinal plants used in Ayurveda, vol. III; p. 512-536.
9. Database on Medicinal plants used in Ayurveda, vol. I; p. 360-377.

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