



A clinical study on Kamala Vyadhi(Jaundice) with Ayurvedic Management - A Case Study

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ABSTRACT:

Jaundice is a condition in which a yellowish tinge appears on the skin, in mucous membrane and the sclera. Body fluids color also changes. Jaundice frequently indicates a problem with liver functioning. When the liver is not working properly, it can cause waste material called bilirubin build up in the body. Clinical signs of jaundice occur when the serum bilirubin level exceeds 2.5 to 3 mg/dl. In Ayurveda Jaundice described as Kamala. In Kamala disease there is loss of desire to do anything. Kam means different type of desires of the body and mind. Desires especially regarding the diet and physical activity of the body are minimised in Kamala. Patient was treated with an integrated approach of Ayurveda treatment including Virechana Karma (purgation) and Shaman Chikitsa. This paper discusses a patient seen in the IPD of Kaychikitsa department. His chief complaints are yellowish discoloration of skin, icterus, yellowish discoloration of urine, anorexia, abdominal pain since 10 days. This patient was effectively treated by the combination of Kutaki Churna, Arogyavardhini Vati and Phaltrikadi Kwath. These Ayurveda formulations relieve the symptom of Daurbalya (weakness), Kshudha Mandya (Appetite loss), Pitamutrata (yellow discolouration of urine), Hrullasa (nausea) and Udarshoola. Also, these drugs reduce bile in blood circulation and normalize the other blood parameter. Here, a case report of a 21 years male was having Kamala (hepatocellularj jaundice) who was treated with some herbs and Virechana like Panchakarma and get effectively result with Ayurveda management.

Keywords: Ayurveda, Kamala, Virechan, Shaman Chikitsa, Kutaki Churn, Phaltrikadi Kwath, Arogyavardhini Vati

Introduction:

Jaundice is a yellowish discolouration of tissue resulting from the deposition of bilirubin. Jaundice, also known as icterus is a yellowish or greenish pigmentation of the skin and whites of the eyes due to high bilirubin levels.

Jaundice is a clinical manifestation of disorders of underlying bilirubin metabolism, hepatocellular dysfunction, or biliary obstruction. Tissue deposition of bilirubin occurs only in the presence of serum hyperbilirubinemia and is a sign of either liver disease or less often a haemolytic disorder. Jaundice can develop in people of all ages and is normally the result of an underlying condition. New-borns and older adults have the highest likelihood. Presence scenario, industrialization brings a lot of changes in our lifestyle and especially in our food eating habits. Most of the people have become used to spicy fast-food day by day. This change in lifestyle invites various diseases. Also, there is increased prevalence of hepatitis due to increased population living in congested area, poor sanitation consumption of unhygienic food and polluted water etc.

Most of the times, people complain of weakness and tiredness, these signs and symptoms resemble to Kamala disease(jaundice). It is caused by vitiation of Pitta with signs and symptoms like Haridra Netra Twak Nakh. Modern science has only symptomatic treatment for hepatocellular jaundice. An Ayurveda text has mentioned hepatocellular jaundice as Kamala. Other conditions that can cause yellowish skin but are not jaundice include carotenemia from eating large amounts of certain foods and medications like rifampicin.

Allopathic system of medicine is basically designed to alleviate the symptoms. On the other hand, Ayurveda based upon mind, body, soul theory and make use of natural product with fewer side effects and is targeted to eliminate root cause by establishing balance in body physiology. It also recommends diet and life style modification for alleviating disease. In Ayurveda texts many formulations are described for treatment of Kamala.

Ancient Acharyas has also mentioned “Kamali Tu Virechanana” as Chikitsa Sutra.

This case study show that Ayurveda herbs give effective result in jaundice.

Case study:

A 21-year male came with following chief complaints:

1. Udarshoola (abdominal pain)
2. Kshudhamandya (appetite loss)
3. Hrullas (nausea)
4. Chhardi (frequent vomiting)
5. Mutra Pitata (yellow discolouration of urine)
6. Vitasanga (severe constipation)

History of present illness:

Patient was asymptomatic before 10 days. Gradually he developed abdominal pain, nausea, and vomiting, severe constipation, loss of appetite and yellow discolouration of urine. Patient has not taken any medication yet. He came to our hospital for management.

Past history:

No H/O DM, Asthma, HTN.

No H/O alcoholism

H/O travelling 15 days ago

General examination

Pulse rate – 68/min

BP – 110/70 mmHg

Respiratory rate: 19/ min

Weight: 58 kg

Height: 162 cm

Ashtavidha Pariksha

Nadi /Pulse – Pitta, Vata

Mala (stool) – Malavshtambha (constipation)

Mutra (urine) – Peetavarniya

Jihva (tongue) – Samata

Sparsha (skin) – Ushna

Akruti – Madhyam

Druk (eyes) – Pita Varniya

Systemic examination:**Respiratory system examination**

Mild shortness of breath

Congestion: Absent

GIT system examination

P/A examination: Hard abdomen

Tenderness: Positive in umbilical and hypogastrium area

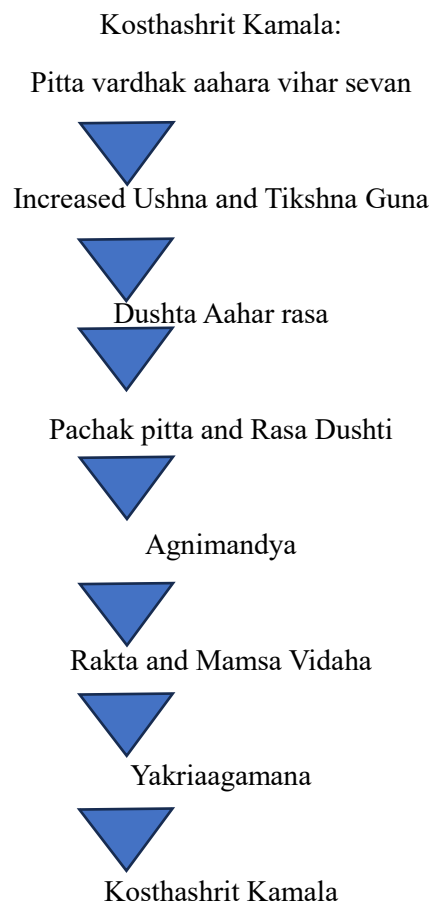
Constipation: Present

CARDIOVASCULAR SYSTEM

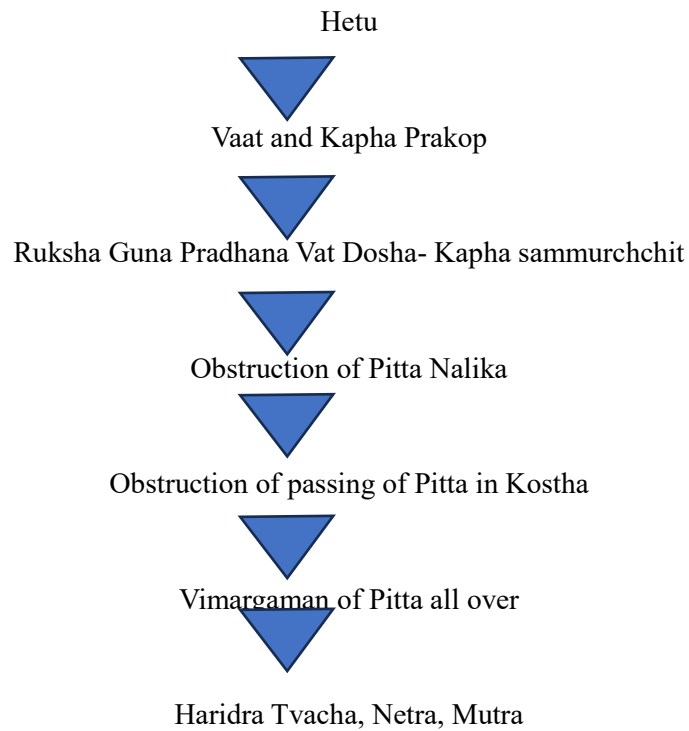
S1 and S2 heard normally ,No added sounds heard.

CENTRAL NERVOUS SYSTEM

Well conscious ,Well oriented with the time, person and place ,Reflexes are normal.

Samprati**Samprapti Ghataka**

1. Dosha – Pitta
2. Dushya -Rakta and mansa
3. Adhisthana- Kostha (mahasrotas) and shakha
4. Srotas - Rasavaha, raktavaha, annavaha, pureeshvaha srotas
5. Srotodushti – Atipravritti, sanga, vimarg Gamana



Samprapti Ghataka

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Treatment Plan

1. Virechana Karma
2. Internal Ayurvedic medication
3. Observation of investigation report

1. Virechana Karma: Due to frequently intake of Pittakara Aahara (spicy and hot food), it leads to vitiation of Pitta Dosha and Virechana (purgation) is the first line of treatment for Pittadushti.[5] Kutaki 500 mg twice in day with luke warm water. But patient complaining of abdominal pain even after Virechana. As Virechana was given without Sneha Pana, it results in vitiation of Vata Dosha which causes pain. Then Eranda Tail 20ml with luke warm water for 3 days was given to the patient. As a result, abdominal pain along with other symptoms was relieved.
2. Internal medication
3. Aarogyavardhini Vati 2TDS
4. Phalatrikadi Kashaya 20 ml twice in day with normal water.

Pathya Ahara and Vihar

Ahara

1. Carbohydrate rich diet – bread, rice, potato, yam, custard, sugarcane juice
2. Cereals – Old rice (Oriza sativa), Barley (Hordeum vulgare), Godhuma (wheat).
3. Pulses – Adhaki (red gram – Cajanus cajan), Kulattha (horse gram), Mudga (green gram)
4. Vegetables – leafy vegetables like lettuce and spinach.
5. Fruits – Orange, Watermelon, Apple, Jambu (Syzygium cumini), Kapitha (Feronia limonia), grapes, pears, carrot and beets. Avoid fried and fatty food

Vihara (Lifestyle Modification)

Aasanas (Gomukhasana, Nokasana, Matsyendrasana, Dhanurasana), Kapalbhathi, Pranayama.

Before:

880025			
LABORATORY REPORT			
Name : [REDACTED]		Sex/Age : Male / 21 Years	BirthDay : [REDACTED]
Case ID		Ref Id1 :	[REDACTED]
Sample Type : EDTA Sample		Pro. Loc : [REDACTED]	Passport :
Reg Date and Time : 09-Nov-2024 11:36 AM		Ref. By : Dr. [REDACTED]	
Sample Date and Time : 09-Nov-2024 11:36 AM		Pt. Loc : Hospital	
Report Date and Time : 09-Nov-2024 12:50 PM		Bill. Loc. : Hospital	
HAEMOGRAM			
Method : Electrical Impedence/Optical Analysis by Automated cell Counter			
Parameter		Results	Unit Biological Ref. Interval
BLOOD COUNT			
Hemoglobin (Photometric)	Photometric	16.80	gm% 13.0 - 17.0
RBC Count	Electrical Impedence /Optical Analysis by Automated cell Counter	6.50	mill/cmm 4.5 - 5.5
WBC Count	Electrical Impedence /Optical Analysis by Automated cell Counter	6800	/cmm 4000 - 10000
Platelet Count	Electrical Impedence /Optical Analysis by Automated cell Counter	150000	/cmm 150000 - 410000
DIFFERENTIAL WBC COUNT		[%]	EXPECTED VALUES [Abs] EXPECTED VALUES
Polymorphs (VCSn/microscopy)	50	% 40-80	3400 /cumm 2000-7000
Lymphocyte (VCSn/microscopy)	40	% 20 - 40	2720 /cumm 1000-3000
Eosinophils (VCSn/microscopy)	04	% 1 - 6	272 /cumm 20-500
Monocytes (VCSn/microscopy)	06	% 2 - 10	408 /cumm 200-1000
Basophils (VCSn/microscopy)	0	% <1-2	0 /cumm
BLOOD INDICES			
Hematocrit/PCV	calculated	50.00	% 40-50
MCV	Measured	L 76.90	fL 83-115
MCH	calculated	L 25.90	Pg 27-32
MCHC	calculated	33.60	g/dL 31.5-34.5
RDW-CV	calculated	H 18.00	cv% 11.6 - 14.0
MPV	Platelet Histogram	9.30	fL 7.2 - 11.7
RBC MORPHOLOGY	Normocytic, Normochromic		
WBC MORPHOLOGY	Premature cells are not seen.		
PLATELET MORPHOLOGY	Platelets are adequate on smear. Platelets Aggregates seen.		
Malarial Parasite	Malarial parasites are not seen.		
Processing Branch : 405 Pushkar Annexe, Near Devi Cinema, Naroda, Ahmedabad, Gujarat 382330			

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Before

LABORATORY REPORT			
Name : [REDACTED]	Sex/Age : Male / 21 Years	BirthDay : [REDACTED]	
Case ID : [REDACTED]	Ref Id1 : [REDACTED]	Passport : [REDACTED]	
Sample Type : SERUM	Pro. Loc : [REDACTED]		
Reg Date and Time : 09-Nov-2024 11:36 AM	Ref. By : [REDACTED]		
Sample Date and Time : 09-Nov-2024 11:36 AM	Pt. Loc : Hospital		
Report Date and Time : 09-Nov-2024 12:54 PM	Bill. Loc. : Hospital		
Parameter	Result	Unit	Biological Ref. Interval
ALT (S.G.P.T) <small>IFCC Without Phosphatase 5 Phosphate Activation</small>	3153.50	U/L	<50 U/L
BILIRUBIN			
Total Bilirubin <small>(BFD)</small>	2.26	mg/dL	0.3-1.2 mg/dl
Direct Bilirubin <small>(BFD)</small>	1.46	mg/dL	< 0.2 mg/dl
Indirect Bilirubin <small>Calculation</small>	0.80	mg/dL	Up to 0.7
----- End Of Report -----			

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After:

LABORATORY REPORT		
Name : [REDACTED]	Sex/Age : Male / 21 Years	BirthDay : [REDACTED]
Case ID : [REDACTED]	Ref Id1 : [REDACTED]	Passport : [REDACTED]
Sample Type : EDTA Sample	Pro. Loc : [REDACTED]	
Reg Date and Time : 19-Nov-2024 12:20 PM	Ref. By : [REDACTED]	
Sample Date and Time : 19-Nov-2024 12:20 PM	Pt. Loc : Hospital	
Report Date and Time : 19-Nov-2024 01:40 PM	Bill. Loc. : Hospital	

HAEMOGRAM**Method : Electrical Impedence/Optical Analysis by Automated cell Counter**

Parameter	Results	Unit	Biological Ref. Interval
BLOOD COUNT			
Hemoglobin (Photometric)	14.70	gm%	13.0 - 17.0
RBC Count	5.70	mill/cmm	4.5 - 5.5
WBC Count	7000	/cmm	4000 - 10000
Platelet Count	200000	/cmm	150000 - 410000
DIFFERENTIAL WBC COUNT			
	[%]	EXPECTED VALUES	[Abs]
Polymorphs (VCSn/microscopy)	50 %	40-80	3700 /cumm
Lymphocyte (VCSn/microscopy)	30 %	20 - 40	2800 /cumm
Eosinophils (VCSn/microscopy)	03 %	1 - 6	310 /cumm
Monocytes (VCSn/microscopy)	06 %	2 - 10	500 /cumm
Basophils (VCSn/microscopy)	0 %	<1-2	0 /cumm
BLOOD INDICES			
Hematocrit/PCV	calculated	48.00 %	40-50
MCV	Measured	L 86.00 fL	83-115
MCH	calculated	L 30.00 Pg	27-32
MCHC	calculated	33.60 g/dL	31.5-34.5
RDW-CV	calculated	H 13.00 cv%	11.6 - 14.0
MPV	Platelet Histogram	9.40 fL	7.2 - 11.7
RBC MORPHOLOGY	Normocytic, Normochromic		
WBC MORPHOLOGY	Premature cells are not seen.		
PLATELET MORPHOLOGY	Platelets are adequate on smear. Platelets Aggregates seen.		
Malarial Parasite	Malarial parasites are not seen.		

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Reg Date and Time : 19-Nov-2024 12:20 PM	Ref. By : 			
Sample Date and Time : 19-Nov-2024 12:20 PM	Pt. Loc : Hospital			
Report Date and Time : 19-Nov-2024 01:40 PM	Bill. Loc : Hospital			

Parameter	Result	Unit	Biological Ref. Interval
ALT (S.G.P.T) <small>(IFCC Without Pundoxal 5 Phosphate Activation)</small>	140	U/L	<50 U/L
BILIRUBIN			
Total Bilirubin <small>(DPD)</small>	1.36	mg/dL	0.3-1.2 mg/dl
Direct Bilirubin <small>(DPD)</small>	0.90	mg/dL	< 0.2 mg/dl
Indirect Bilirubin <small>Calculation</small>	0.80	mg/dL	Up to 0.7

----- End Of Report -----

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Discussion: During the treatment, patient was kept only on oral medication for a period of 1 month. Thus, after the one month of treatment, patient had got significant improvement in all symptoms. Now patient is gradually improving and there is no recurrence of symptoms after the 3 months of follow up. The results were appreciable in both the clinical and laboratory criteria. Statistically, relief in yellowish colour of eyes and urine, loss of appetite, weakness and in reduction in serum bilirubin levels. The trial drugs have been used in management of Kamala (Jaundice) in Ayurveda texts and Nighantus. Study has shown improvement in appetite and taste, Yakrit Uttejaka properties. Therefore, combination of both the drugs are more significant than individual. Once the Doshik homeostasis has been achieved, the signs and symptoms of Kamala are relieved automatically because the disease and its different manifestations are all produced by Doshas.

These drugs act as Rasayana, improve Dhatu formation, are Tridoshaghna, Vatashamaka, Raktashodhaka, Pitta Sarana and therefore relieve signs and symptoms of Kamala. The Drugs have proved effective in relieving cardinal features of Kamala.

In Ayurveda, Ancient Acharyas have mentioned Agnimandya and Pitta Dosha as the main etiological factors for Kamala

The hypo functioning of Agni produces Ama/ Amavisha which corresponds with Rakta and may produce Kamala. Kamala is a Pitta and Rakta Pradoshaj Vyadhi in which Pitta Dosha is vitiated and it can be normalized by the Madhura, Tikta and Kashaya Rasa. In our Ancient classics, single drug along with compound drug have been mentioned in Kamala. These drugs have Kamalahara properties. These Ayurvedic formulations relieve the symptoms of Daurbalya (weakness), Kshudhamandya (Appetite loss), Pitamutrata (yellow discoloration of urine), Hrullasa (nausea) and Udarshoola. Also, these drugs reduce bile in blood circulation and normalize the other blood parameters.

As the drugs have established properties, it may be inferred that the drugs are safe and suitable in management of Kamala. Regarding mode of action we have rationally discussed above properties and action which might be responsible to bring changes in sign and symptoms of Kamala. This shows majority of action of the drug are due to Guna Prabhava. However, observing the outstanding changes in the condition of patients we have opinion that drug acts certainly by Dravya Prabhava also. Therefore, we may infer that the action of the Drug in improving the sign and symptoms of Kamala patients by Dravya Guna Prabhava.

On the basis of vivid description of all the herbal drugs are common for the treatment of Hepatocellular jaundice and other liver disorders. Since it is a purely herbal preparation hence very much safe and more effective than any other herbomineral preparation. In short these drugs have following properties i.e. Pittahar, Pittarechak, Yakrid Uttejak, Deepan, Rechan, Pachak, Shothhara, Jwarahara, Kamala and Panduhara, Yakrit and Raktvikarhara, Tridoshar, Rasayan, Pittasarak, Anulomak, and Raktapittahara. Charaka has mentioned in the 16th chapter of Chikitsa Sthana "Kamalitu-Virechana". According to the description of this chapter Virechana is the best method among the all treatments of Kamala Roga (Kosthas Akhashrita i.e., infective Hepatitis). General principle of treatment of this disease is Shodhana and Sanshamana Chikitsa. Liver (Yakrit) is the Mula-Sthana of Rakta. Rakta-Pitta has Ashray and Ashraayi Sambhanda hence for elimination of vitiated Pitta Dosha Virechan is the best Chikitsa.

Conclusion

From the above discussion, we have concluded that Ayurveda line of management i.e., Virechana therapy and Shamana Chikitsa is successful in the management of Kamala. By removing toxic waste from the body and by correction of Agni, there was marked reduction of symptoms like yellowish discoloration of skin, icterus, yellowish discoloration of urine, anorexia. According to ancient text, in Kamala, there is a vitiation of Pitta Dosha. Acharya Charak has mentioned Mridu Virechana Chikitsa for Kamala. Hence, Virechana is considered best for pacifying Pitta Dosha.

No unwanted effect of therapy was observed during treatment and during follow-up period. So, it can be concluded that these herbal medicines are very effective in management of Kamala. But to establish this effect further study of longer duration and larger sample is required. On the modern parameters we can say that the Herbal Hepato protective preparations have Cholagogue and Cholertic action, Hepatocellular regeneration, Antiviral, Antioxidant, Enzymes and Metabolic correction, Digestive, Membrane stabilizing effect, Immuno modulating action, anti-inflammatory action and Antipyretic Action.

Reference

1. Davidson, Edited by brain R. Walker, Davidsons Principles and practice of medicine, 22nd edition, Diabetic neuropathy, page 831, sear-2006
2. Green JB, Bethel AN, Armstrong PW, Duse JB, Engel SS, Garg J, et al. Effect of Sitagliptin on cardiovascular outcomes in type II Diabetes. New England Journal of Medicine, 2015; 232 -242
3. Rajeshwardatta Shastri, Charak Samhita of Agnivesh Elaborated Wit Part-2, Chikitsa Sthan; Pandu Chikitsaadhy: Chapter 16, Verse No. 40: Ed. 19th Varanasi: Choukhamba Bharti Academy, 1993; Page No. 493
4. Green JB, Bethel AN, Armstrong PW, Duse JB, Engel SS, Garg J, et al. Effect of Sitagliptin on cardiovascular outcomes in type II Diabetes. New England Journal of Medicine, 2015; 232 -242
5. Rajeshwardatta Shastri, Charak Samhita of Agnivesh Elaborated Wit Part-2, Chikitsa Sthan; Panduchikitsaadhy: Chapter 16, Verse No.
6. Ed.19th Varanasi: Choukhambabharti Academy, 1993; Page No. 487
7. Rajeshwardatta Shastri, Charak Samhita of Agnivesh Elaborated Wit Part-2, Chikitsa Sthan; Panduchikitsaadhy: Chapter 16, Verse No. 32- 34: Ed.19th Varanasi: Choukhamba Bharti Academy, 1993; Page No. 491.
8. Ayush Kumar Garg, Amit Singh, Harish Vishnoi, Gulab Chand Meena, Chandan Singh, Manoj Adlakha. Swine Flu- The Changing Scenario and Preparedness with Formulation of "Win Flu Air Freshener Gel. International Journal of Ayurveda and Pharma Research. 2017;5(11):14-20.
9. Bhattacharya S.K., Satyam K.S and Ghoshal K.S. anti-oxidant activity of glycowithanolides from withania somnifera. Indian journal exp. Biol; 1997 vol 35 pp 236-239

10. Ayush Kumargarg Et Al: Role of Medhya Rasayan in Geriatric Health Care W.S.R. To Mental Health. International Ayurvedic Medical Journal {online} 2017 {cited February, 2017} Available from: http://www.iamj.in/posts/images/upload/330_337.pdf
11. Bhavmishra, Edited by Chunekar KC, Pandey GS. Bhav Prakash Nighantu, Varanasi, Chaukhamba Bharti Academy; 2006.
12. Ayush kumar garg, Amit Singh, Harish Vishnoi, Chandan Singh, Manoj Kumar Adlakha. Traditional Dietary Pattern of Indian Food and its Scientific Basis: An Overview. AYUSHDHARA, 2016; 4(1):983-985.
13. Harish Vishnoi et al.2018, Effect of Ayurvedic Herbs In The Management of Lower Limb Complications Related To Diabetes Neuropathy- A Case Study. Int J Recent Sci Res. 9(2), pp. 24579-24581. DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0902.1687>
14. Ayush Kumar Garg et al.,2019, Madanaphala (Randia Dumetorum): A Pharmacological and Pharmacognostical Review. Int J Recent Sci Res. 10(04), pp. 32061-32064. DOI: <http://dx.doi.org/10.24327/ijrsr.2019.1004.3391>.
15. Rajeshwardatta Shastri, Charak Samhita of Agnivesh Elaborated Wit Part-2, Chikitsa Sthan; Panduchikitsaadhy: Chapter 16, Verse No. 5- 7:19th ed. Varanasi: Choukhambabharti Academy, 1993; Page No. 487
16. Shastri, Charak Samhita of Agnivesh Elaborated Wit Part-2, Chikitsa Sthan; Panduchikitsaadhy: Chapter 16, Verse No. 32- 34: Ed.19th Varanasi: Choukhamba Bharti Academy, 1993; Page No. 491.
17. Ayush Kumar Garg, Amit Singh, Harish Vishnoi, Gulab Chand Meena, Chandan Singh, Manoj Adlakha. Swine Flu- The Changing Scenario and Preparedness with Formulation of “Win Flu Air Freshener Gel. International Journal of Ayurveda and Pharma Research. 2017;5(11):14-20.
18. Bhattacharya S.K., Satyam K.S and Ghoshal K.S. anti-oxidant activity of glycowithanolides from withania somnifera. Indian journal exp. Biol; 1997 vol 35 pp 236-239
19. Ayush Kumargarg Et Al: Role of Medhya Rasayan in Geriatric Health Care W.S.R. To Mental Health. International Ayurvedic Medical Journal {online} 2017 {cited February, 2017} Available from: http://www.iamj.in/posts/images/upload/330_337.pdf
20. Bhavmishra, Edited by Chunekar KC, Pandey GS. Bhav Prakash Nighantu, Varanasi, Chaukhamba Bharti Academy; 2006.
21. Ayush kumar garg, Amit Singh, Harish Vishnoi, Chandan Singh, Manoj Kumar Adlakha. Traditional Dietary Pattern of Indian Food and its Scientific Basis: An Overview. AYUSHDHARA, 2016; 4(1):983-985.
22. Harish Vishnoi et al.2018, Effect of Ayurvedic Herbs In The Management of Lower Limb Complications Related To Diabetes Neuropathy- A Case Study. Int J Recent Sci Res. 9(2), pp. 24579-24581. DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0902.1687>
23. Ayush Kumar Garg et al.,2019, Madanaphala (Randia Dumetorum): A Pharmacological and Pharmacognostical Review. Int J Recent Sci Res. 10(04), pp. 32061-32064. DOI: <http://dx.doi.org/10.24327/ijrsr.2019.1004.3391>.
24. Rajeshwardatta Shastri, Charak Samhita of Agnivesh Elaborated Wit Part-2, Chikitsa Sthan; Panduchikitsaadhy: Chapter 16, Verse No. 5- 7:19th ed. Varanasi: Choukhambabharti Academy, 1993; Page No. 487
25. Davidson, Edited by brain R. Walker, Davidsons Principles and practice of medicine, 22nd edition, Diabetic neuropathy, 2006,page 831.