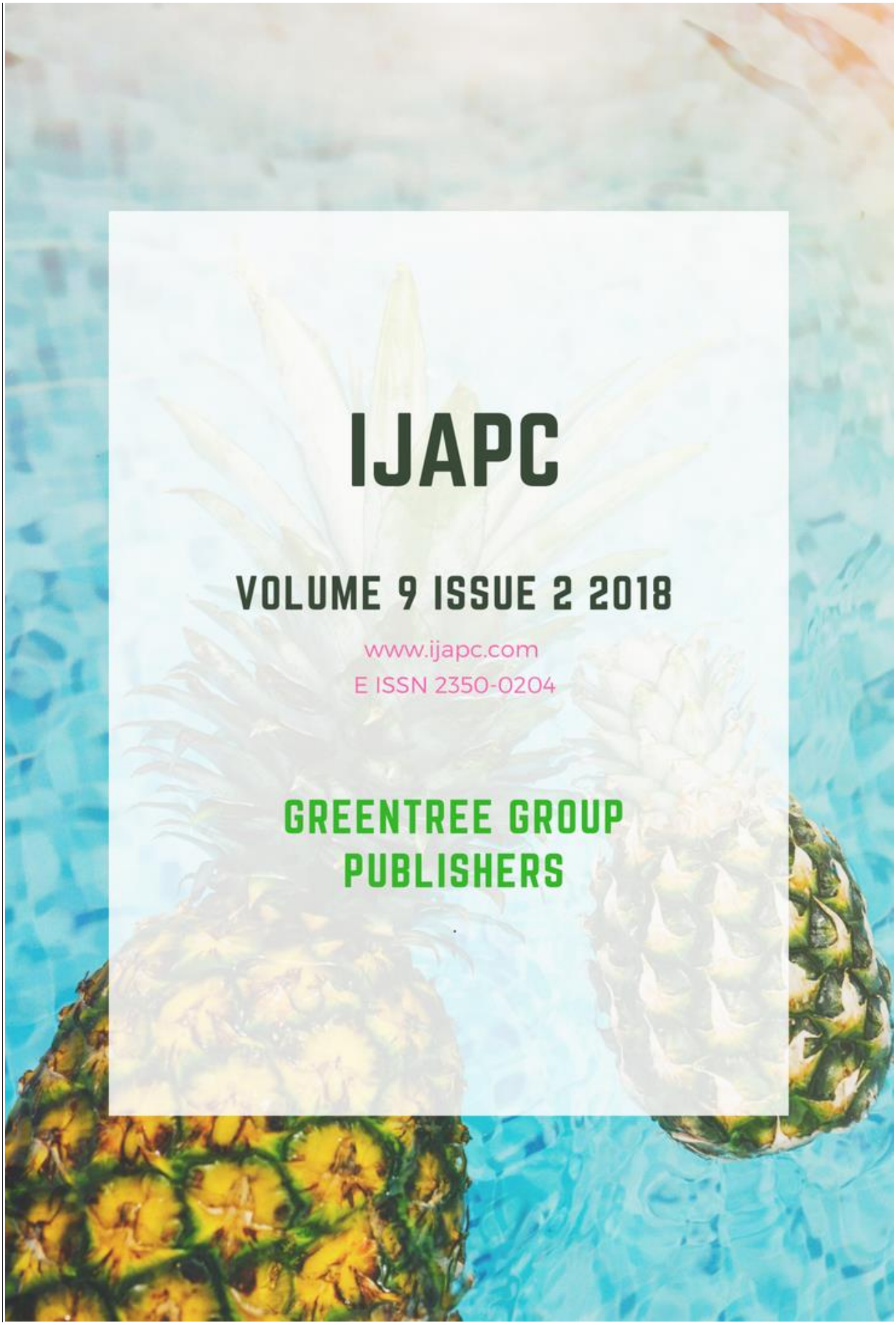

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Vidarikandadi Churna: A Drug Review

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ABSTRACT

Nutrition, also called nourishment, is provision of materials to cells and organisms in the form of food to support life. Adequate food and nutrition are essential for proper growth and physical development, optimum work capacity, normal reproduction, adequate immunity and resistance to infections. Malnutrition is a common paediatric ailment that is seen in India. Term malnutrition refers to both undernutrition as well as overnutrition. Inadequate diet may produce several forms of undernutrition in children. Under-nutrition including intrauterine growth restriction, protein energy malnutrition, stunting, wasting and various micronutrient deficiencies are the major underlying factors contributing to the death of about 3 millions children each year that is 45% of the total. *Vidarikandadi Churna* is an Ayurvedic formulation for malnutrition. Description of this formulation is mentioned in Ayurvedic literature Yoga Ratnakar. The effectiveness of the drug can be attributed to the pharmacological properties of its individual components. This article reviews the chemical constituents and experimental based pharmacology of contents of *Vidarikandadi Churna*. *Vidarikandadi Churna* possesses various pharmacological action like *Balya* (strength-promoting), *Brinhana* (bulk-promoting), *Jivaniya* (vitaliser), *Rasayana* (tonic), *Santarpana* (Nourishing) and *Sthairyakar* (promotes stability) property. The aim of this article is to support the pharmacological potential of *Vidarikandadi Churna* and its ingredients with scientific evidence.

KEYWORDS

Malnutrition, Vidarikand, Godhum, Yava, Yoga Ratnakar

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INTRODUCTION

Malnutrition in children is the most common problem in developing countries. As per National Family Health Survey (NFHS-3, 2005-06) 43% of under 5 children were underweight, 48% were stunted, and 20% were wasted. Prevalence of severe (<-3SD) underweight, severe stunting and severe wasting was 16%, 24% and 6% respectively [1].

The above data indicates that malnutrition in children is one of the most common problems in India. The nutritional status of women and children is particularly important, because it is through women and their off-spring that the pernicious effects of malnutrition are propagated to future generations [2].

In Ayurved prevention and management of malnutrition is by enhancing the immunity in child through proper nutritious diet (food management) and use of herbal medicine. *Vidarikandadi Churna* is one of the important herbal medicine that is used to cure childhood malnutrition. Main constituents of *Vidarikandadi Churna* are *Vidarikand* (*Pueraria tuberosa*), *Godhum* (*Triticum sativum*), and *Yava* (*Hordeum vulgare*). Detailed description of this formulation is found in ayurvedic text Yoga Ratnakar [3].

MATERIALS & METHODS-

Many databases including research articles from Pub med, J-AIM, Research Gate, Ayurved research data base (6th edition from 2001-2014 thesis included), ayurvedic, ~~various~~ modern text books and API were considered reviewed with the key words like Malnutrition, *Vidarikand, Godhum, Yava,* Yoga Ratnakar, chemical constituents of study drugs, pharmacological properties, in vivo study, in vitro study etc.

Properties of Individual Drugs-The main constituents of *Vidarikandadi Churna* are *Vidarikand, Godhum* and *Yava*. The properties of individual drugs are as follows-

Vidarikand-

Morphology-*Vidarikand* is the dried tuber of *Pueraria tuberosa* (family-*fabaceae*), a large perennial climber with tuberous roots, up to 60 cm long and 30 cm thick They are distributed nearly throughout India[4].

Synonyms- *Vidari, Ikshugandha*[5]

Chemical Constituents- Pterocarpan-tuberosin, pterocarpanone –hydroxy tuberosone, two Pterocarpan -anhydro-tuberosin and 3-o-methyl anhydro-tuberosin and a coumestan tuberostan and isoflavone–puerarone and a coumestan puerarostan[6]. Phytoestrogen puerarin.

Phytoestrogen puerarin has been reported in the roots of *Pueraria tuberosa* [7, 8]

Tubers of *Vidarikand* have 64.6% carbohydrate, 10.9% protein [9].

Ayurvedic Pharmacology-*Ayurvedic pharmacology* is based on five mechanisms of action or attributes of a substance and through *Prabhav* (specific potency) in some exceptional drugs. These five attributes are – [10]

Rasa-*Madhura* (sweet), ***Guna(property)***-*Guru* (heavy), *Snigdha*(unctuousness), Virya ***(potency)***- *sita* (cold), *Vipaka*-*Madhura* (sweet), ***Karma***-*Vatahara* (Vata dosha pacifier), *pittahara* (Pitta dosha pacifier), *hrdya*(cardiotonic), *brhana* (bulk promoting), *vrsya*(aphrodisiac), *mutral* (diuretic), *balya*(strength-promoting), *stanya*(galactagogue), *svarya* (beneficial for throat), *vajikarana* (Aphrodisiac), *varnya* (promoting complexion of skin), *jivaniya*(vitaliser), *rasayan*(tonic).

Therapeutic uses- *Raktapitta dosha* (pacify Rakta pitta dosha), *Sukra kshya* (increase semen), *daha* (pacify burn), *kshya* (pacify weakness), *kasa* (helpful in cough), *sula* (pacify pain), *mutrakricchra* (helpful in dysuria), *visarpa* (pacify skin disorder), *visamjawar* (fever).

Dose-3-6 gm

Part used- tuber

Pharmacodynamic study of Vidarikand-

1-In mouse models, isoflavone genistein exerts anti-inflammatory properties affecting granulocytes, monocytes, and lymphocytes [11].

2-Effect of ethanol extract of *P. tuberose* on sexual behaviour of male rats showed a significant androgenic stimulation as evidenced by an increase in the weight of ~~the~~ testis, epididymis, and seminal vesicles. Spermatogenesis was also improved and was evidenced by improvement in the histoarchitecture of testicular sections. It can therefore be stated that the weight gain in secondary sexual organs is correlated with increased levels of serum FSH and testosterone by PT[12].

3-*Pueraria tuberosa* contain phytoestrogen. A number of scientific investigations have shown that phytoestrogen compounds exert biological activity via the central nervous system [13].

4-Amongst other pharmacological properties of phytoestrogens are their antioxidant, neuroprotective, antidepressant, and anxiolytic activities. Phytoestrogens present in *Pueraria tuberosa* might be contributing to the improvement of sexual behaviour in rats. Phytoestrogens like daidzein and genistein also affect neurobehavioural actions are largely antioestrogenic, either antagonising

or producing an action in opposition to that of oestradiol [14].

5-*Pueraria tuberose* is also reported to possesses numerous activities like nootropic, antioxidant and antifertility [15-17].

6--*Vidarikand* possesses growth hormone inducing and nootropic properties. By induction of growth hormone. *Vidarikand* may promote weight gain[18].

7-*Vidarikand* also shows the antioxidant property [19].

8- Isoflavone was originally speculated to act as an anti-inflammatory agent[20].

9- Effect of tuber extract of *Pueraria tuberosa* on Wistar rats shows improvement in chronic foot shock stress[21].

10- A study was carried out in albino rats and mice. Tuber extract of *Pueraria tuberosa* shows adaptogenic activity i.e. it increases mean duration of anoxia tolerance time[22].

***Godhum*- [23]**

Morphology-*Godhum* (wheat-Triticun sativum) belongs to graminae family. *Godhum* is an annual grass widely cultivated mostly in northern parts of India. Stem-tufted, hollow, erect or semi erect, Leaves-very long and narrow and possesses ligule and auricle, Flower-Spike, Grains –oblong with blunt ends.

Chemical Constituents-each 100 gm of wheat contains moisture 12.8gm, protein-11.8 gm, fat-1.5 gm, minerals -1.5 gm, fiber-1.2 gm, carbohydrate-71.2 gm, calcium-41 mg, phosphorous- 306 mg, iron-5.3 mg[24]. Caloric value of 100 gm wheat is 364kcal[25].

Ayurvedic property of Godhum (wheat)-*Godhum* is sweet in taste, cooling, heavy, reduces vata and pitta, enhances kapha and sukra (semen) acts as a tonic, demulcent, *sandhanakara* (repair the tissues), laxative (helps in elimination of faeces), vitalizer, nourishing and promoter of complexion. It heals ulcers and promotes taste and stamina[26].

Pharmacodynamic property of Godhum-

1-Every part of the whole wheat grain supplies elements such as protein, minerals, B-group vitamins and dietary fibre that are needed by the human body[27].

2-Starch and gluten in wheat provide heat and energy.

3- Wheat acts as a body building agent[28].

4-The wheat germ contain riboflavin, thiamine, vitamin E and trace minerals such as zinc, copper, iron, and magnesium.

5-B complex vitamins especially thiamine, riboflavin and niacin offered by natural brown wheat promote energy and nourishment to skin and blood vessels[29].

***Yava* [30]**

Yava (Hordeum vulgare) belongs to family poaceae

Morphology-It is one of the oldest cultivated cereals. It is an annual plant erect, stout and tufted. Leaves few linear lanceolate, Flowers-spikes, Fruit-caryopsis, grooved on the inner face.

Chemical Constituent-Each 100 gm *Yava* contains moisture-12.5 gm, protein-11.5gm, Fat-1.3 gm, Minerals-1.2gm, Fibre-4 gm, carbohydrate-70 gm, calcium-26gm, phosphorus-15 mg, iron-1.67 mg[31].

Ayurvedic Property of Yava-

Yava is *ruksha*(*rough*), *sheeta*(*cold*), *laghu* (light), *Madhur* (sweet), *bahupurishkara* (producing abundance of faeces), and balya (tonic) and alleviates disease of kapha[32].

Pharmacodynamic Property of Yava-

1-*Yava* has proven effect that it is good source of energy and maintains the energy stores for long time as compared to wheat and rice[33].

2-The study conducted on various strains of *Yava* concluded that it has antioxidant property and its immunomodulatory property has also been evaluated[34].

Study on formulation

1-A study was done in which total 72 cases were registered for the study and were randomly divided into two groups. Group A comprising of 38 and Group B of 34 students. Eight from Group A and four from Group B discontinued the trial. Group A treated with *Vidarikandadi yoga* and Group B was treated with placebo. The data was analysed using Online InStatGraphPad.As. As the assessment criteria has all parametric values, paired' t Test was used, and results are calculated in each group to study the efficacy separately in each group. For the inter group comparison unpaired t' Test was used. Results are shown below - [35]

In this study, for weight statistically highly significant ($P < 0.001$) difference was observed in *Vidarikandadi Yoga*, whereas significant ($P < 0.05$) result was obtained in placebo. For chest circumference, in *Vidarikandadi Yoga* significant ($P < 0.05$) results were obtained and in placebo, there was no significant difference. Significant ($P < 0.05$) difference was noted in *Vidarikandadi Yoga* for mid-arm circumference. In *Vidarikandadi Yoga*, significant ($P< 0.05$) results were obtained for mid-thigh circumference, whereas placebo group showed non-significant ($P > 0.05$) difference. Intergroup comparison of *Vidarikandadi Yoga* over placebo showed statistically significant results for weight and chest circumference. On the other hand, the difference was non-significant for height; mid-arm circumference, and mid-thigh circumference. For Push-Up Test, highly

significant ($P < 0.001$) results were obtained for *Vidarikandadi Yoga* and significant ($P < 0.05$) results for Placebo. In the same way for Sit-Up Test highly significant ($P < 0.001$) results were obtained for *Vidarikandadi Yoga* and significant ($P < 0.05$) results were obtained for placebo. For Hand Grip Strength Test, statistically highly significant ($P < 0.001$) results were obtained for *Vidarikandadi Yoga* and significant ($P < 0.05$) results were obtained for placebo.

Intergroup comparison of *Vidarikandadi Yoga* over placebo showed statistically highly significant results for all the three tests .For Ruler Drop Test, statistically highly significant ($P < 0.001$) results were found for *Vidarikandadi Yoga* and significant ($P < 0.05$) results for *placebo separately*. Results of intergroup comparison between *Vidarikandadi Yoga* and placebo showed statistically non-significant results. For Resting Heart Rate (RHR) and Resting Respiratory Rate (RRR), statistically highly significant ($P < 0.001$) differences were found in *Vidarikandadi Yoga*, whereas non-significant difference in placebo. For Harvard Step Test (HST), highly significant ($P < 0.001$) results were found in *Vidarikandadi Yoga* and non-significant ($P > 0.05$) results were found in placebo. By intergroup comparison of *Vidarikandadi Yoga* over placebo, significant results were found in all the three variables i.e., RHR, RRR, and HST

2-In another study there was 30 patients divided into two group that is 15 patients in group A and 15 patients in group B. Group A was treated with Vidarikandadi Vati and Group B was treated with Ksheerabala Tail Basti. The result of the study was-weight gain in Group A in percentage was 6.63% and in Group B was 10.70%. Height gain in Group A was 0.60% and in Group B was 0.78%.There was also found significant relief in head circumference, chest circumference and mid arm circumference in both groups[36].

DISCUSSION- The drug *Vidarikandadi Churna* has three ingredients viz. *Vidarikand*, *Godhum*, and *Yava*. All the three drugs have of Madhura rasa except that of Yava having both *Madhura* (sweet) and *Kashaya rasa*. (astringent). Guru (heavy) property is evident in all the three drugs, whereas *Snigdha* (unctuous) property is mentioned for *Vidarikand and Godhum*, and *Yava* is having *Ruksha* property. All the three drugs are of *Sheeta Virya* (cold potency). Vipaka of *Vidarikand* and *Godhum* is *Madhura* (sweet) and that of *Yava* is *Katu* (pungent)in nature.

All the components of *Vidarikandadi Churna* are ~~of~~ *Jivaniya* (vitaliser), *Brinhana* (bulk-promoting), *vrsya* (aphrodisiac) Balya (strength promoting), *Mutral(*diuretics) ~~*Balya, Brinhana, Jivaniya, Rasayana*~~[37](*Vidarikand*), ~~*Santarpana*~~ [38] sandhanakara (union-promoting) (*Godhum*), and *Sthairyakrita*(*stabiliser*)(*Yava*)[39] property. As far as *Doshaghnata* (pacify doshas) is considered *Vidarikand* and *Godhum* are *Vata pittahara* (pacify Vatapitta dosha),[40-41] where as *Yava* is *Pittakaphahara* (pacify pitta kapha)[42].

Classical indications suggest their use in *Kashaya*[43](Wasting), *Shosha* (Emaciation), *Daurbalya* [44] (Debility), *Sthairyakrita* [45] (Stabilizing) etc. Ayurveda holds the concept of *Brinhana* (bulk promoting) for overall growth of the body and potentiating the strength, energy and endurance in the healthy individuals. Hence, this drug was selected to enhance the physical strength and sport performance of children.

Vidarikand possesses growth hormone inducing [46] and nootropic properties. By induction of growth hormone *Vidarikand* may promote weight gain and physical strength of the body. The research on *Vidarikand* suggests significant anxiolytic and anti-stress properties of *Pueraria tuberosa* extract (PTE), confirming the clinical efficacy of the plant mentioned in Ayurveda[47].

Adaptogenic activity of *Vidarikand* proves its utility in tolerating the stress produced as a result of physical and mental exertion[48].Apart from above potential *Vidarikand* has immunomodulatory and anti-oxidant properties too. These properties of drug have additional benefit in keeping the individual's fitness to the optimum level[49]

The wheat contains several medicinal properties. Starch and gluten is rich source of heat and energy that are found in wheat. Essential amino acids, vitamins B and E that are found in wheat helps in build and repair muscular tissues of the body.

The study conducted on various strains of Barley concluded that it has anti-oxidant property and its immunomodulatory property has also been evaluated[50].

Thus, it can be said that overall effect of all the ingredients of the study drug "*Vidarikandadi Churna" is* the growth hormone inducing, nootropic, anxiolytic, and anti-stress, adaptogenic, immunomodulatory, and anti-oxidant properties.

CONCLUSION-From the above evidences we can conclude that *Vidarikandadi Churna* ~~it~~ can be used to

cure malnutrition as well as many other diseases. The main constituents of *Vidarikandadi Churna* i.e. *Vidarikand, Godhum, Yava* are important potential medicines in ayurved. It can be used without any side effect.

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