

**Case report on clinical effect of *Khadir* compound drug (*Kitibha har kashay*) in Psoriasis and its cell line study**

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**Abstract:**

Psoriasis is a common skin disease which is inflammatory, proliferative, autoimmune, and chronic with relapsing nature. It resembles with *Kitibha Kustha roga* of Ayurveda which is described as relapsing disease with dry, rough, discolored skin lesions. This is a case report of psoriasis patient who was treated conservatively with *Kitibha har kashay* for 3 months. The assessment of clinical improvement was made, along with the biochemical profiling and photographic analysis. Patient was also instructed to follow the do's and don'ts of the disease for diet and lifestyle also called *pathya* and *apthya*. Parameters that were used to assess the clinical improvement were PASI score, IGA scale and grading of Ayurvedic clinical symptoms of *Kitibha*. The patient was given the medication prepared from the Ayurvedic Pharmacy, Faculty of Ayurveda, BHU in ghan form. The crude and prepared drug was standardized from Institute itself and the data of the patient was maintained by regular follow-ups. The cell line study of water extract of *Khadir* compound was also done to evaluate the proliferative or antiproliferative action by MTT assay. The clinical result have shown that this drug posses a very effective antipsoriatic action that has significantly reduced PASI score to nil and marked improvement in IGA scale, clinical symptoms and photographic improvement was found. The cell line study by MTT assay has shown the antiproliferative action of *Daruharidra* (*Berberis aristata*) that was one of the constituent of *Kitibha har kashay*. Further study of this drug on psoriasis specific cytokines is needed to be evaluated by biochemical analysis to evaluate its role in breaking the pathology of psoriasis.

**Keywords:** *Kitibha har kashay*, psoriasis, PASI score, MTT assay, cytokines.

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**Introduction:**

Psoriasis is a common skin disease that has a prevalence of 0.09%-11.43% worldwide.<sup>1</sup> *Ayurveda* describes this disease as *Kitibha* which is chronic and relapsing type of *Vata kapha* predominant skin disease.<sup>2</sup> There are several successful treatments present in *Ayurveda* that cures this disease by breaking the pathology. The modern medicine are recently focusing on the drugs that works on specific inflammatory markers of psoriasis (TNF alpha antagonist) and certain drugs that arrest the abnormal growth of keratinocytes (Methotrexate).<sup>3</sup> Diet and lifestyle are related to psoriasis and it comes under metabolic disorder in which there is reduced serum adiponectin.<sup>4</sup>

**Aim of the study:**

The case study plan was conducted to analyze the role of *Khadir* compound drug (*Kitibha har kashay*) in clinical improvement of *Kitibha* and effect of its water extract on different cell line by MTT assay.

**Case report:**

After taking proper written consent of patient, demographic data with history and examination of the patient was done. A married male patient who was a shopkeeper by profession (sitting job), of 41 yrs age, belonging to Hindu community from middle class family of Kharpur village, District Gaya, Bihar, India, visited the *Kayachikitsa* OPD of Sir Sunderlal Hospital, IMS BHU, with MRD no. 4502666 on 13 December 2021. The symptoms of the disease were itchy, dry, scaly, erythematous lesion scattered in most of the body parts since last 8 years. Bleeding was present in the patient when the scales were removed. The patient complained of aggravation of symptoms in winter season and reduction in summers.

**History of present illness:**

Patient was asymptomatic 8 years back. Gradually he developed the skin lesion first on the scalp with itch and scales. He visited to a local physician for the treatment who gave him some ointment to apply on the lesion. The lesions were not cured completely and in a period of three to four months new lesions started to appear in other parts of the body. He again visited to take allopathic treatment for his illness that was relieved in 2-3 months. But as he left the treatment the disease again started to flare up. In a period of 8 years he noticed that the symptoms were relieved in summers and aggravated in winter season. Also on sun exposure there was increased in itching in the lesions. Patient also gave history of using multani mud for cleaning the scalp hair before the disease appeared.

**Past history:** There was no history of other systemic diseases like jaundice, diabetes, anemia etc.

**Treatment history:**

He took allopathic treatment for 3-4 months and homeopathic treatment for 2-3 months. He had also taken *Ayurvedic* treatment for 1.5-2 years. He was relieved in the symptoms, but relapse was present.

**Personal history:**

His appetite was normal, bowel habit was twice a day, sound sleep of 6-8 hours, urine was passed 5-6 times/day with no history of addiction.

**Family history:** There was no family history for psoriasis found in this case.

**Dietary and lifestyle history:**

The patient was a vegetarian and was fond of eating high calorie diet with habit of frequent eating street food like *samosa* and sweets. He was having a habit of eating new cereals (< 1 year) and milk products on regular basis. The sitting job of the patient supported his sedentary life style that is a cause of *santarpan janya roga*.

**Examination of the patient:****Systemic examination:**

General condition of the patient was fair, with blood pressure of 120/84 mm of Hg, and pulse of 104/min. Temperature of the patient was 98<sup>0</sup>F with a height of 5 feet 3 inches. The weight of the patient in initial visit was 70 kg with truncal obesity.

In 10 fold Ayurvedic examination (*dashavidha pariksha*) of the patient, it was found that the patient was *Kapha* predominant *pitta vataj prakriti*, whose *Vikriti* was *vata kaphaj Kitibha* that vitiated the skin, blood, adipose tissue and lymphatic. Quality of tissues was analyzed in which skin, blood and adipose tissue were of lower quality and rest others were medium. Compactness of musculature was medium, with fondness to sweet and salt taste. Psychological and physical power was medium with good appetite. Measurement of other body parts was almost normal except the abdomen that had truncal obesity and the patient was of young age group. Except for abnormal touch, and disfigured appearance of skin, other parameters were normal. Local examination was done in which lesions were assessed for dryness, roughness scaling, redness, itching, thickness and pain before and after treatment.

#### **Diagnosis of the disease:**

After differential diagnosis of the disease among *Kitibha*, *Ek kusth*, *Charma Kustha*, *Dadru*, *Darunaka* and *Sidhma*, provisional diagnosis was made of *Kitibha Kustha*. The final diagnosis was made by analyzing all the points of *Panchanidan*. Faulty diet and lifestyle was found to be the main cause of disease in this patient. Prodromal symptoms that were present in the patient were excess sweating, round lesions and itching. Dryness, redness, elevation, itching, roughness were present in the skin lesions of the patient. His symptoms were relieved by following do's and don'ts of skin disease and summer season but aggravated in winters and following faulty diet and lifestyle. Final diagnosis was made of *Kitibha Kustha* and the components of pathogenesis are given in table no.1.

**Table no.1.**

S.no.	COMPONENTS	DESCRIPTION
1.	Disease	<i>Kitibha Kustha</i>
2.	Sub type	<i>Kshudra Kustha</i>
3.	<i>Dosha</i>	<i>Vata kapha</i> predominant <i>tridosha</i>
4.	<i>Dushya</i> (tissues vitiated)	Skin, blood, adipose tissue, lymph
5.	Stage of the disease	Chronic
6.	Category	<i>Santarpanjanya</i>
7.	Seasonal aggravation	Winter season
8.	Prognosis	<i>Yapya</i> or incurable
9.	Relapse	Present
10.	Disease path	<i>Bahya</i> (external)
11.	Channels involved	<i>Raktavaha strotas</i> (Liver and spleen)

#### **Treatment plan:**

Treatment was planned for three months with follow up in every month that was divided into three parts. Time line is given in Table no. 2.

1. Local and systemic drugs.
2. *Pathya* and *apthyā* (Do's and don'ts) of skin disease.
3. Reassurance therapy (To reduce the anxiety caused by relapsing nature of the disease).

**Table no. 2 Timeline:**

1st month (13/12/21-12/01/22)	<ul style="list-style-type: none"> <li><i>Kitibha har kashya ghan vati</i> 500 mg TID</li> <li><i>Winsoria oil LA</i> twice a day.</li> </ul>
2nd month (13/01/22- 12/02/22)	<ul style="list-style-type: none"> <li><i>Kitibha har kashaya ghan vati</i> 500 mg TID</li> <li><i>Winsoria oil LA</i> twice a day.</li> </ul>
3rd month (13/2/22-13/03/22)	<ul style="list-style-type: none"> <li><i>Kitibha har kashaya ghan vati</i> 500 mg TID</li> <li><i>Winsoria oil LA</i> twice a day.</li> </ul>

Assessment of improvement was done by analyzing the pre and post treatment effect on the basis of:

1. Subjective assessment. (PASI score, IGA scale, clinical feature grading) (Table no 3)
2. Photographic assessment. (Pre1, during 2,3 and post treatment 4.) Figure 1.
3. Safety profiling. (Biochemical investigation of Blood)

**Table no. 3.**

S.no.	Score and C/F	Initial visit	1 <sup>st</sup> follow up	2 <sup>nd</sup> follow up	3 <sup>rd</sup> follow up
1.	PASI score	18	15	6	0
2.	IGA score	3	2	1	0
3.	Dryness	3	2	1	0
4.	Roughness	3	2	1	0
5.	Scaling	2	1	0	0
6.	Redness	3	2	1	0
7.	Itching	3	2	1	0
8.	Thickness	2	1	0	0

Safety profiling was done by biochemical analysis of blood markers before and after treatment in which renal function test, liver function test were found to be normal before and after treatment. There was elevated serum cholesterol and low density lipoprotein before treatment that was normal after treatment. ESR was raised in the patient.

Diet and lifestyle instructed in the treatment of *santarpanjanya vyadhi*<sup>5</sup> (Metabolic disorders) and *kustha roga* (skin disease) was advised to follow by the patient. Few of them are to take light digestive diet, old cereals and pulses, bitter taste vegetables etc. He was advised to avoid milk products, sweet, salty and sour food items. In lifestyle he was advised to do light physical exercise, and avoid day time sleep. In ethics he was advised to do worship of Lord Shiv Family.

#### **Cell line study of *Kitibha har kashay* in different cell lines:**

*Kitibha har kashay* contain equal amount of *Khadir saar* (Acacia catechu) (AC), *Daruharidra Kastha* (*Berberis aristata*) (BA) and *Nimb chal* (*Azadirachta indica*) (AI).<sup>6</sup> *Khadir* is categorized under *Kusthaghna mahakashaya and salsaradi gana*. Heartwood of AC has active phytochemical called catechins which are antioxidant, anti-inflammatory, chemoprotective, anti diabetic and antibacterial.<sup>7</sup> *Daruharidra* is categorized under *lekhaneeya, kandughna, Arshoghna mahakashaya, haridradi gana, priyangvadi gana, mustadi gana*, and *Lakshadi gana*. BA has berberine as an active phytochemical that is found to have antiproliferative action on keratinocytes.<sup>8</sup> This property of BA is mainly useful in the treatment of psoriasis in which there is proliferation

of keratinocytes of skin. *Nimb* is categorized under *kandughna mahakashaya*, *Aragvadhadi*, *Guduchyadi* and *Lakshadi gana*.

**Figure no. 1: Photographs of the patient before (1), during (2-3) and post treatment (4).**

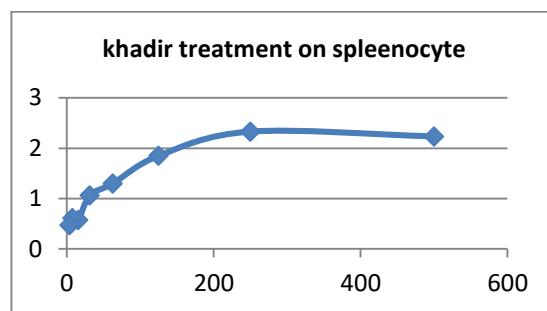


AI has a nimbin as active phytochemical that is found to have antipyretic, hypoglycemic, fungicidal, antihistaminic and antiseptic properties, with anti-inflammatory and antioxidant effects.<sup>9</sup>

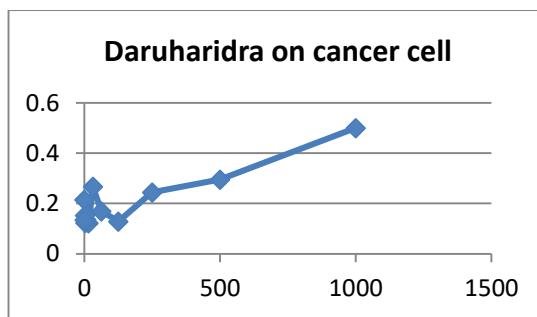
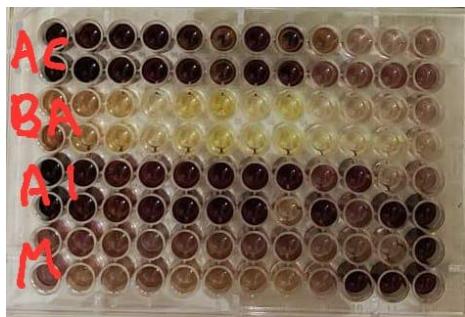
**Study plan by MTT assay:** It is a colorimetric test done to evaluate the cell viability, proliferative or antiproliferative effect of drug on different cell lines.<sup>10</sup> The reading of viable cells is done by micro plate spectrophotometer. The study was conducted in the immunology lab of Department of Biochemistry, Faculty of Science, BHU. Spleenocytes, Macrophage and cancer cell line was chosen for the study. Water extract of AC, BA and AI was used in different concentration by serial dilution on these cell lines.

Result of MTT assay suggested the proliferative effect of AC on spleenocytes and macrophages (Figure 2, Graph 1). AI also has proliferative effect on macrophages (Figure 4, Graph 3). BA was found to have antiproliferative affect on cancer cell line and macrophages same as Methotrexate. But AC and AI do not arrest the unnatural growth of cancer cells. (Figure 3, Graph 2)

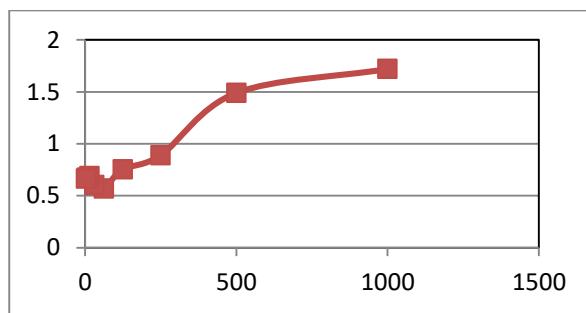
Interpretation of the result suggested that spleenocytes and macrophage are related to immune system and proliferative effect of AC and AI may be useful in enhancing the immune power. The antiproliferative effect of BA on abnormal cancer cells may be useful in abnormal proliferation of keratinocytes in psoriasis.



**Figure 2. : MTT assay in 96 well plate on spleenocytes of mice treated with water extract of Acacia catechu.**  
**Graph 1. OD (X) verses concentration (Y) graph showing proliferative effect on spleen cells treated with water extract of Acacia catechu in different concentration.**



**Figure 2. : MTT assay in 96 well plate on spleenocytes of mice treated with water extract of Acacia catechu.**  
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**Figure 4: MTT assay on macrophage cell line treated with water extract of AC, BA, AI and Methotrexate.**  
**Graph 3. OD (X) verses concentration (Y) graph shows showing proliferative effect on macrophage cells treated with water extract of Azadirachta indica.**

#### Discussion:

Psoriasis is a proliferative, inflammatory and autoimmune skin disease resembling *Kitibha Kustha* of Ayurveda. A case report on effective and safe Ayurvedic medication with clinical efficacy and biochemical assessment for probable mode of action is aimed in this study. High calorie diet and sedentary lifestyle play a role in casing psoriasis both in Ayurveda and recent researches. So it is important to advice correct diet and lifestyle

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for psoriasis patients<sup>11</sup>. There are many herbs that are used to treat psoriasis, among all a compound formulation of three herbs described by Acharya Vagbhat that has been named *Khadir har kashay* has been taken to analyze for its clinical efficacy. It was found to have a significant improvement in subjective and objective parameters of psoriasis. *Khadir*, *Daruharidra* and *Nimb* are well known medicinal herbs with potent active phytoconstituent with specific mechanism of action on different cell lines. MTT assay was done on Spleenocytes, Macrophages and cancer cell line to assess the effect of water extract of all the three herbs separately. It was found that *Daruharidra* has antiproliferative effect in both macrophage and cancer cell line. That supports its previous work done that has proven its inhibitory action of DNA and protein synthesis, arrest cell cycle and have anti cancer effect<sup>8</sup>. These properties of *Daruharidra* may become beneficial in breaking the pathology of psoriasis. *Khadir* has proliferative effect on spleenocytes that support its antioxidant effect of previous researches. *Khadir* and *nimb* has proliferative effect on spleen cells and macrophages that supports the effect on immune system. Further study design on specific cells like keratinocytes, specific pro-inflammatory and anti-inflammatory markers may help to know the specific effect of drug for treating psoriasis.

#### **Conclusion:**

Result of case study on psoriasis treated by *Kitibha har kashay* has shown significant improvement assessed by PASI (Psoriasis Area Severity Index score), IGA (Investigators Global Scale), clinical feature scale and photographic assessment. MTT assay which is a colorimetric test used to analyze cell viability demonstrated antiproliferative effect of water extract of *Daruharidra* (*Berberis aristata*) in cancer cell line that may be useful in psoriasis. Also proliferative action of *Khadir* (*Acacia catechu*) on spleenocytes is supporting the immunomodulating effect of it. *Nimb* (*Azadirachta indica*) is also found to have proliferative effect on macrophage cell line. Such study design may give the base to develop a new insight for gaining knowledge about the mechanism of action of drug to break the pathology in psoriasis and other disease and choosing a proper treatment plan of a disease.

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**Declaration:** Institutional ethical clearance was taken from Institute of medical sciences, Banaras Hindu University Varanasi, India CTRI registration number was obtained.

**Conflict of interest:** The authors declare no conflict of interest.

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