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The Role of Ayurvedic Medicine in the Treatment of Eczema.

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The Role of Ayurvedic Medicine in the Treatment of Eczema.



**THESIS
SUBMITTED TO THE UNIVERSITY OF RAJSHAHI
IN THE FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF PHILOSOPHY
IN BOTANY.**

SUBMITTED BY

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JUNE 2013

DEDICATION

My Beloved Parents

DECLARATION

This dissertation entitled “The Role of Ayurvedic Medicine in the Treatment of Eczema” submitted by Rahima Akther Khatoon in the fulfillment of the requirements for the degree of Master of Philosophy, under University of Rajshahi. The study was carried out at the outdoor Govt. Unani and Ayurvedic Medical College and Hospital, Mirpur, Dhaka during the session 2006-2007.

(Rahima Akther Khatoon)

Candidate

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Rahima Akther Khatoon

ABSTRACT

Eczema is a chronic relapsing atopic dermatitis associated with purities, sleep disturbance and poor quality of life of the patient. Treatment of eczema includes use of emollient, topical and systemic antimicrobial agents, corticosteroid or immunomodulating agents. Many patients also seek alternative treatments such as dietary avoidance, supplementation or both. The research examines the basic pathophysiology of eczema and clinical trials involving Ayurvedic medicine in the treatment of eczema.

For the evaluation of efficacy and safety of a Ayurvedic medicine, the study had been designed in four-groups, one group was kept as normal control group (A-Group) and other three groups were treated with test drug (C-Group) or allopathic drugs (D- Group) and another group was not given any drug (B- Group) ayurvedic drugs Holud (*Curcuma longa*) Durva grass (*Cynodon dactylon*) Neem (*Azadirachta indica*) are used as test drug.

The experiment was conducted to investigate combined herbs. During the study 160 populations were interviewed. This was an 8-week, open labeled study of combined Ayurvedic preparation (tablet and ointment). Patients received the tablet three times daily for 8 weeks and ointment to be applied over the affected areas thrice daily for 8 weeks. Efficacy was evaluated on the basis of parameters of modified eczema area sensitivity index and physician's and patient's global evaluation at follow-up visits. 149 patients completed the study with reduction in symptoms of eczema to varying degrees. An interventional follow up study was conducted to find out the role of Ayurvedic medicine in the treatment of Eczema and socio-demographic characteristics of the respondents and attributes associated with the disease.

Almost all of the patients 81.25% improved during their course of treatment. After third follow-up conditions deteriorated in 3.12% respondent and 8.75% fully cured. Due to the failure of coming at follow-up, the condition of few respondents (6.87%) could not be evaluated. This study confirms the efficacy of test the drug (tablet and ointment) in Bangladeshi patients with eczema.

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1. INTRODUCTION

1.1 ECZEMA AS A DISEASE

Eczema is a disease in a form of dermatitis or inflammation of the epidermatitis. The terms “eczema” and “dermatitis” may be used interchangeably, and describe the same clinical and histological entity. Both words are derived from Greek, “eczema” meaning “to boil”: describing the characteristic tiny blisters of the condition and “dermatitis” meaning inflammation of the skin. There are several patterns of the condition, and a common convention is to describe as “eczema” that are endogenous or constitutional, and as ‘dermatitis’ that are exogenous or due to contact. Some of the most common types are reviewed (Strickland *et al.*, 1994) Contact dermatitis (that includes those inflammations due to external agents) is classically broken down into two categories; irritant contact dermatitis (which includes all non-immunologic mechanisms) and allergic contact dermatitis (due to an acquired immunologic response) (Vogler *et al.*, 1999). A very large number of compounds found in daily life, either at home or at work, may be responsible for allergic contact dermatitis. Common are metals such as nickel, topical medicaments such as betamethasone valerate (a steroidal anti-inflammatory), ointment bases and preservatives, balsams and fragrances, dyes, plants and rubber compounds (Warner *et al.*, 2003) Irritant contact dermatitis is the commonest cause of hand eczema, and is seen particularly in housework, as well as with oils and greases in industry. Contact with anything that dehydrates the skin, particularly water, detergents and soaps, and degreasers, removes the natural protective oils of the skin, allowing evaporation of water and penetration

of irritants. The longer the skin is exposed to such treatment, the more likely is the development of dermatitis (Ernst *et al.*, 2000) Atopic dermatitis is a genetically acquired, chronic relapsing skin condition with its expression principally determined by environmental allergens, infections, as well as skin barrier defects. It is characterized by severe itching, eczematous skin lesions with often distinctive distribution and dryness of the skin (Avila *et al.*, 1997) In addition, colonization and secondary infections with *Staphylococci* and *Streptococci* have been observed to exacerbate atopic dermatitis (Strickland, 2002) It affects about 5-20% of children worldwide with prevalence rates in the western world increasing in the last few decades. Symptoms can also persist or begin in adulthood Seborrhoeic dermatitis is an erythematous-squamous condition of unknown etiology with a prevalence of approximately 2.5%. It involves the areas of the body with a high density of sebaceous glands, i.e., the face, scalp and upper trunk, and occurs after puberty, when these glands become active. One of the most commonly named pathogenic factor of seborrhoeic dermatitis is the overgrowth of *Pityrosporum ovale*, yeast that are normal commensal on the skin (Hunter *et al.*, 1991).

1.2 ECZEMA IN THE WORLD

Globally eczema has affected approximately 230 million people as of 2010 (3.5% of the population) (Lancet, 2010) The lifetime clinical-recorded prevalence of eczema has been seen to peak in infancy, with female predominance of eczema occurring during the reproductive period of 15–49 years (Osman *et al.*, 2007). Although little data on the trend of eczema prevalence over time exists prior to the Second World War (1939–45), the prevalence of eczema has been found to have increased

substantially in the latter half of the 20th Century, with eczema in school-aged children being found to increase between the late 1940s and 2000 (Gupta, 2004). A review of epidemiological data in the UK has also found an inexorable rise in the prevalence of eczema over time (Taylor, 1984). Further recent increases in the incidence and lifetime prevalence of eczema in England have also been reported, such that an estimated 5,773,700 or about one in every nine people have been diagnosed with the disease at some point in their lives (Simpson *et al.*, 2009). It is broadly applied to a range of persistent skin conditions characterized by one or more of these symptoms: redness, skin edema (swelling), itching and dryness, crusting, flaking, blistering, cracking, oozing, or bleeding (Eczema, 2010). Classification of eczema is difficult because of many different clinical forms and unknown etiology (Happle, 1993). However, eczema is divided into two groups; exogenous eczemas, e.g. contact dermatitis, are related clearly to defined external triggering factors, although inherited tendencies can also play a part, whereas endogenous eczema, e.g. atopic dermatitis, seborrhoeic dermatitis, is not a result of exogenous or external environmental factors, but is mediated by processes originating within the body (Mackenzie, 1999). In Bangladesh somewhat higher (24.81%) than the in UK. This may be due to tropical weather of this country. Certain patterns of eczema are commonly seen in particular age groups. Most cases of eczema that are seen in infants and young children are atopic in type. Discoid eczema occurs particularly in elderly males in winter and asteatotic eczema on the legs is common among both elderly males and females (Johnson, 1978). In an investigation of the pattern of endogenous eczema in the Northern frontier, Kingdom of Saudi Arabia, 1224 patients were studied over a three-year period from January 1991 to December 1993. Atopic eczema was the most

common type of endogenous eczema (Johnson, 1978). Therefore, the main goal of this study was to provide preliminary data about the burden of eczema among dermatologic patients by assessing the following: the proportion of various types of eczema, the distribution of eczema according to gender and age and its incidence according to the month or season. Along with this the control measures of this with effective way. A study in the UK examining the details of 6819 dermatological consultations of 3500 in a general practice from 1958 to 1985 showed that eczema patients comprised 19% of the consultations. But we found seborrhoeic dermatitis is the commonest eczema. This may be due to hot and humid weather of our country in most period of the year.

1.3 ROLL OF TRADITIONAL MEDICINE IN THE TREATMENT OF ECZEMA

Of the many indications where traditional herbal medicines have been used, skin and skin related disorders rank among the top where up to one-third of these traditional medicine compared to 1-3% of modern drugs are used for treatment of wounds or skin disorders (Thomson *et al.*, 2000) Indeed, skin disorders are among the most prevalent in the world. Prevalence studies done locally have also observed similar trends where skin diseases have been identified among the leading causes of hospital visits with even more unreported cases (Mozelsio *et al.*, 2003). Skin diseases are amongst the most common causes of morbidity in rural and urban areas of developing countries accounting for a high proportion of visits to healthcare centers. For instance, a study done to determine the prevalence of skin diseases in a rural community in the southwestern part of Ethiopia found more than half of all the households and 80% of the selected children to manifest one or more skin diseases (Del Beccaro *et al.*, 1995).

This high prevalence is similar to the results obtained in a rural Tanzanian community and that done on primary school children in Turkey (Villar *et al.*, 1994).

Traditional medicinal is a major component of indigenous system of medicine in Bangladesh TM include ayurvedic and unani in Bangladesh which are well established (Alam, 2007). From the above discussion it is found that a number of plant are being used in traditional medicine to get cured formed eczema. Out of a house list of used plant the following 20 plants are frequently used in ayurvedic medicine.

1.4 LIST OF THE SINGLE DRUGS USED FOR TREATING THE ECZEMA

- I. Holud (*Curcuma longa*)
- II. Durva grass (*Cynodon dactylon*)
- III. Neem (*Azadirachta indica*)
- IV. Parish (*Thepesia populnea*)
- V. Tamak (*Nicotiana tabacum*)
- VI. Ghetu (*Celerodendrum viscosum*)
- VII. Ponsi (*Artocarpus heterophyllus*)
- VIII. Kemok (*Costus speciosus*)
- IX. Chichingga (*Tricosanthes anguina*)
- X. Scute/Skullcap (*Scutellaria baicalensis*)
- XI. Danpi (*Cortex Moutan Radix*)
- XII. Bai Shao (*Radix Paeoniae Alba*)
- XIII. Weilingcai (*Potentilla Chinensis Ser*)
- XIV. Gan Cao (*Radix glycyrrhizae*)

- XV. Jingyinhua (*Flos lonicerae*)
- XVI. Bohe (*Herba menthae*)
- XVII. Danpi (*Cortex moutan*)
- XVIII. Cangzhu (*Rhizoma atractylodis*)
- XIX. Huangbai (*Cortex phellodendri*)
- XX. Licorice Root (*Glycyrrhiza glabra*)

1.5 ECZEMA NATURAL CURE AND TREATMENT WITH AYURVEDIC REMEDIES

Eczema is also known as vicharchika in Ayurvedic medicine and is thought to be a mild form of leprosy. Typically, Ayurvedic medicine seeks to prevent diseases by keeping or returning the three doshas to the correct levels. The reason you develop a condition is because one of the doshas is either present in excess or is insufficient. In the case of eczema, pitta is thought to be out of balance with the other doshas.

Useful herbs include Turmeric, Barberry root (*Berberis vulgaris*), Sariva (*Hemidesmus indica*), Gotu kola (*Centella asiatica*), Manjishta (*Rubia cordifolia*), Sandalwood and Guggul (*Commiphora mukul*) for acute cases. For chronic cases, tonic herbs such as Bala (*Sida cordifolia*), Licorice root, Shatavari (*Asparagus racemosus*) and Gokshura (*Tribula terrestris*) are recommended, once diet and gently detoxifying herbs have been used and the tongue is cleaned. Triphala (a formula of *Emblica off.*, *Terminalia chebula* and *Terminalia belerica*) is excellent for clearing toxins, by taking half a teaspoon of the powder in a little warm water at night. Turmeric, with its effective anti-inflammatory action, is one of the best herbs for all skin problems used both orally and topically. A key constituent, curcumin has anti-inflammatory, antibacterial and antioxidant effects (Araujo *et al.*, 2001), whilst

combined curcuminoids appear to help protect epidermal skin cells from free radical stress (Bonte *et al.*, 1997). Being a polyphenol, the compound curcumin stabilizes collagen (Landis and Khalsap 1998) and is good for all connective tissues. Ghee is considered excellent for external use in skin problems such as rashes and burns. Aloe Vera gel is another beneficial application for most skin problems and can be mixed with a pinch of turmeric powder, as is the juice of coriander leaves. Neem oil can be very effective. Saffron is a specific herb for nourishing the skin and can be taken internally as a milk decoction (quarter gram per cup), and also used in external skin preparations (Frawley, 2000). Tea or juice of Tulsi (*Ocimum sanctum*) leaves can be taken internally and used externally to bathe the skin (Rai, 2000).

1.5.1 Vata Type Eczema

Follow a Vata reducing diet and lifestyle with sesame oil massage and castor oil laxative or enemas. Pungent, bitter and astringent tasting foods should be reduced, while sweet, sour and salty tastes are recommended. Nourishing and cleansing herbs for internal use include Triphala, *Guggul*, *Shatavari*, *Bala*, and *Cardamom*. *Chitrak* (*Plumbago zeylanica*), *Guduchi* (*Tinospora cordifolia*), *Cardamom* and *Punarnava* (*Boerhavia diffusa*). Triphala powder mixed in warm water, or Triphala guggul capsules, can be given before bed. Medicated ghee can be used internally and externally. Useful herbs for medicating the ghee include Triphala, *Musta* (*Cyperus rotundus*), *Manjishta*, *Gokshura*, *Chitrak*, *Neem*, *Guduchi*, *Cardamom*, *Punarnava*, and *Vacha* (*Acorus calamus*) root.

1.5.2 Pitta Type Eczema

Follow an anti-pitta diet, avoiding possible allergens such as dairy produce, vegetables from the nightshade family, as well as oranges, peaches and strawberries. Sour, salty and hot spicy foods are best avoided, while sweet, bitter and astringent foods are recommended. Drinking coconut juice is helpful, along with coriander leaf juice. Exposure to sun and heat is best avoided. Recommended herbs for internal use include bitter cleansing herbs such as burdock root (*Arcium lappa*), Neem, Guduchi, Manjishta, and laxative herbs such as Dandelion root (*Taraxacum off.*) and Triphala can be helpful. Also recommended are Gotu kola, Sandalwood, Kutki (*Picrorrhiza kurroa*), Musta, Chirata (*Swertia chiretta*), Aloe Vera juice, and Amalaki.

Helpful therapies for external application include rose water, coconut juice, Aloe Vera Gel, coriander leaf juice, Gotu kola oil, and Bringaraj oil. Sandalwood in oils, creams, or the powder made into a paste, has a cooling anti-inflammatory effect. I use a cream that contains Sandalwood, Neem and Turmeric which is effective. Baths with herbs of Musta, Bakuchi (*Psoralea corylifolia*) and Triphala can be useful.

1.5.3 Kapha Type Eczema

A Kapha reducing diet and lifestyle is recommended by avoiding all heavy, greasy and oily food, particularly cheese and yogurt. Sweet, sour and salty tasting foods should be reduced, while pungent, bitter and astringent foods are recommended. In India emetic therapy is used as the initial treatment, but here in the West expectorant herbs such as Thyme, Elecampane (*Inula helenium*) or Hyssop (*Hysoppus off.*) may be used. Useful herbs for internal use include Gokshura, Guggulu, Triphala,

Manjishta, Ginger, Chitrak, Guduchi, Cardamom, Kushta, (*Saussurea lappa*) and Gotu kola. Diuretic herbs such as Dandelion leaf and Punarnava are useful. Triphala guggul capsules can be given before bed. A formula called Gokshura guggul is also used with warm water or ginger tea (Frawley, 2000). A decoction of Triphala can be used to bathe the skin. Turmeric, Neem and Chamomile are also useful.

A Ayurvedic formulation as mentioned in the classical literature has selected for the treatment of test group in this study. It contains the following ingredients:

1. Holud (*Curcuma longa*)
2. Durva grass (*Cynodon dactylon*)t
3. Neem (*Azadirachta Indica*)

1.6 HYPOTHESIS

Ayurvedic medicine may cure the eczema or eczematous lesions.

1.7 OBJECTIVES

1.7.1 General Objectives

To find out the efficacy of Ayurvedic medicine for cure the eczema or eczematous lesions.

1.7.2 Specific Objectives

- I. To find out the socio-demographic characteristics of study population.
- II. To find out the improvement of the disease conditions after receiving treatment.

2. LITERATURE REVIEW

2.1 LITERATURE REVIEW

Skin is the largest organ of human body, as such plants showing dermatological properties, and to heal wounds and burns are of great significance to human health (Lewis and Elvin-Lewis 2003). Skin diseases occur all over the world, but are prevalent in tropical regions (Davis *et al.*, 1980). Skin diseases occur in various forms (List of cutaneous conditions 2012), basically classified as non-contagious and contagious diseases. Contagious diseases are primarily categorized as bacterial, fungal, viral or parasitic diseases. Skin diseases such as scabies may be caused by mites, rash and itch could be caused by something such as stinging nettles, while diseases such as eczema may be hereditary (National Skin Centre, Singapore 1995). Despite the plethora of antibiotics derived from fungi, microbial diseases are still on the rise in developing countries due to the relative unavailability of medicines and the emergence of wide spread drug resistance (Okeke *et al.*, 2005). In developed countries, such as the United States (US), infectious diseases are commonly treated with drugs (Pinner *et al.*, 1996). Thus, many phytochemical laboratories have long embarked on the search for antimicrobial compounds in higher plants (Hamburger and Hostettmann, 1991). In spite of this, the search for compounds yielding antimicrobial activities, complementary to existing drugs, is considered a priority (Mitscher and Rao 1984). There has been a shift in public preference towards greater acceptance of herbal medicines to treat infectious diseases. This is possibly due to the problems of over prescription and misuse of synthetic antibiotics (Cowan 1999).

Many medicinal plants are readily accessible, contributing to their popularity. It is estimated that plant materials have provided models for 50% of the pharmaceuticals used in Western medicine (Robbers *et al.*, 1996).

Following medicinal plants had been selected for this research to examine their efficacy on eczema:

1. Holud (*Curcuma longa*)
2. Durva grass (*Cynodon dactylon*)
3. Neem (*Azadirachta Indica*)

2.1.1 Holud (*Curcuma longa*)

Scientific classification of the *Curcuma longa*

Kingdom:	Plantae
Division:	Angiosperms
Class:	Monocots
Order:	Commelinids
Family:	Zingiberales
Genus:	Zingiberaceae
Species:	<i>Curcuma</i>

Curcuma longa Linn. (Zingiberaceae, Turmeric or Holud) is a rhizomatous perennial herb and its medicinal extract is called curcumin. Curcumin has been traditionally used as a good source of coloring matter for foods, cosmetics, textiles and as a medicinal ingredient in formulations of the several medicines for ailments from

jaundice, other liver disorder, ulcers, parasitic infections, various skin diseases, sprains, inflammation of the joints, cold and flu (Anonymous, 1950). It possesses anti-inflammatory, hepatoprotective, antimicrobial, anticancer, antitumor, blood purifying, stomachic, antiseptic and anti-viral activities (Anonymous, 1950; Yusuf *et al.*, 1994; Srimal, 1997; Ghani, 2003, and Shaha, 1997). Curcumin also possesses the remarkable activities of preventing or treating alzheimer disease, immunomodulation and correcting cystic fibrosis defects (Balasubramaniam, 2006; Ringman *et al.*, 2005; Egan *et al.*, 2004). The rhizome oil of *C. longa* L. oil is also used as scenting agents in detergents, soaps, air fresheners and insect repellents, intermediate in the synthesis of perfume chemicals and as a pharmaceutical aid (Bakowski and Michalik, 1986). Holud (Turmeric) grows abundantly in India, Indonesia, Srilanka and Cambodia; whilst in Bangladesh it grows at Sreemongal, Bogra, Joydebpur, Comilla, Satkhira, Chittagong, Barisal jessor and Khulna. Though enormous work have been done on various activities of *C. longa* (Joshi *et al.*, 2003; Kitsupa *et al.*, 2004).



Figure 2.1 Holud (*Curcuma longa*)

2.1.2 *Cynodon dactylon*

Scientific classification of *Cynodon dactylon*

Kingdom:	Plantae
Division:	Angiosperms
Class:	Commelinids
Order:	Poales
Family:	Poaceae
Genus:	<i>Cynodon</i>
Species:	<i>C. dactylon</i>

A number of medicinal plants have been used for thousands of years in the traditional system of medicine (Ayurveda) *Cynodon dactylon* (L.) Pers.

(Family: Poaceae) commonly known as “Doob”, “Durva” in India, is a weed and has been regarded to possess various medicinal properties. The plant possesses antimicrobial, and antiviral activity and has also been used to treat urinary tract infection, calculi and prostatitis. The aqueous plant extract is used as anti-inflammatory, anti-epileptic, diuretic, antiemetic and purifying agent. It also has significant application in treating dysentery, dropsy and secondary syphilis. *Cynodon dactylon* has been used as an antidiabetic agent in traditional medicine of the subcontinent. Investigation have reported the hypoglycemic, hypolipidemic and antihyperglycemic activity of the aqueous extract of *Cynodon dactylon* (Katakam *et al.*, 2010).



Figure 2.2 *Cynodon dactylon*

2.1.3 *Azadirachta indica*

Taxonomic position of the *Azadirachta indica*,

- Kingdom : Plantae
- Division : Magnoliophyta,
- Class : Magnoliopsida.
- Family : *Meliaceae*
- Order : Sapindales
- Genus : *Azadirachta* L.
- Species : *A. indica*

The National Research Institutes' 1992 report on neem anticipated that continuing research into the components of a tree known-village pharmacy it would demonstrate useful cures for various ailments, but it's unlikely that even the most optimistic researcher could have predicted the potentially life-saving treatments being identified

now for preventing or treating multiple types of cancer. Although clinical trials with human beings are still in the future, this early test tube and animal research combined with neem's few side effects, easy availability, and low cost in most parts of the world is causing tremendous excitement. Neem contains multiple active compounds that work simultaneously via different mechanisms.

This characteristic explains its effectiveness as a pesticide, and appears to be responsible for its potent impact on cancers as well. One of these documented mechanisms is apoptosis (programmed cell death), which directly kills cancer cells and, in so doing, frees material from these cells that enables immune system cells to take over identifying and destroying them as well, a process called— cross-priming (Kumar *et al.*, 2009). Neem has also been shown to produce substantially higher levels of antioxidants, including the carcinogen-detoxifying enzyme glutathione (Pinner *et al.*, 1996). Perhaps the most important and least surprising is neem's strengthening impact on the immune system (see separate section at for more detailed data and neem, or isolated compounds, have shown impressive efficacy against a wide variety of human cancer cell lines, and animal models for human cancers that include colon, stomach, Ehrlich's carcinoma, lung, liver, skin, oral, prostate, and breast cancers (Sarkar *et al.*, 2009).

In addition to studies showing that pretreatment with neem is highly protective against cancer in animals (eg, neem leaf given to mice reduced chemically induced tumors by up to 87%), and demonstrating the efficacy of neem as a stand-alone treatment, two recent reports suggest that neem pretreatment also enhances the activity while reducing the side effects of some conventional cancer treatments (Kumar *et al.*, 2009).

Much research obviously remains to be done before neem can be recommended for human use, but the consistently impressive results from these *in vitro* and preclinical studies have already inspired tremendous enthusiasm and hope. The abstracts and links that follow provide an overview of these studies. Involvement of the nitric oxide (NO) release in CEAM phi NLGP (carcinoembryonic antigen pulsed macrophages with neem leaf glycoprotein) vaccination and its relationship with vaccine induced type 1 immune response were aimed to study in the present communication. Vaccination with CEAM phi NLGP resulted in macrophage activation as evidenced by its increased number and expression of CD69 marker. Activated macrophages demonstrated upregulation in synthesis of IL-12 and downregulation in IL-10, along with excess IFN gamma production in splenic cells, as evidenced from mRNA analysis. Induction of such type 1 immunity was further confirmed by expression of type 1 specific transcription factor, T-bet and enhancement of intracellular glutathione content. Such vaccination also induced greater nitric oxide (NO) production from macrophages. Dependence of induced type 1 immune response on the NO release and vice versa was studied by *in vitro* neutralization of IFN gamma/IL-12 and *in vivo* inhibition of NO production by methylene blue. Obtained results clearly demonstrated the interdependence of two anti-tumor immune functions, namely, NO production and generation of type 1 immune response. Understanding of the mechanism of this NO related immune modulation would have great impact in proposing CEAM phi NLGP vaccine in clinic for the treatment of CEA+ tumors. The neem tree has attracted considerable research attention as a rich source of limonoids that have potent antioxidant and anti-cancer properties.



Figure 2.3: *Azadirachta indica*

3. METHODOLOGY

3.1 METHODOLOGY

An interventional follow up study was conducted to find out the role of Ayurvedic medicine in the treatment of Eczema and associated socio-attributes demographic characteristics of the respondents (patient) to examine the role of Ayurvedic medicine in the treatment of Eczema. The study was carried out at the outdoor department of Ayurvedic and Unani Medical College and Hospital, Mirpur, Dhaka. This study was conducted as per following methodology:

3.2 TYPE OF STUDY

Interventional follow up study.

3.3 STUDY POPULATION

All patients were enrolled after considering all selection criteria. This hospital based interventional study was conducted from July 2006 to June 2007.

3.4 DEMOGRAPHIC VARIABLE

Age of patient: 12 years to 60 years

Sex : Both male and female

3.5 CLINICAL VARIABLES

Eczema

3.6 INVESTIGATION VARIABLE

Urine for R/E and C/S and Stool RME

3.7 SAMPLE SIZE

160 out of which 80 male and 80 female patients

3.8 SELECTION CRITERIA

3.8.1 Inclusion Criteria

Patient having Eczema and willing to participate.

3.8.2 Exclusion Criteria

The exclusion criteria included

- Patients with infected lesions,
- History of ischemic heart disease,
- Pregnant and lactating women;
- Patients receiving corticosteroid treatment;
- Patients with history of gastritis, peptic ulcer, bleeding ulcers; HIV, HBV
- Known allergic reaction to systemic/topical study drugs.
- Unwilling to participate

3.9 SAMPLING TECHNIQUE

Outdoor department of Unani and Ayurvedic Medical College and Hospital, Mirpur, Dhaka was selected purposively for the convenience of the study. Purposive sampling technique was adopted. All the available the data collection period who fulfilled the study selection criteria were included in the study.

3.10 DATA COLLECTION INSTRUMENT

A semi-structured questionnaire was developed .The questionnaire was developed using the selected variables according to the specific objectives. The questionnaire

contained questions related to: 1) socio-demographic characteristics, 2) Eczema characteristics and other relevant information. A check list section was also developed. Prior to original data collection, a pre-test session was conducted among 10 cases. Necessary modification was done before finalized the questionnaire.

3.10.1 Data Collection Technique

The researcher collected data through face-to-face interview. The interview was conducted anonymously as far possible .Before preceding the data collection, the detail of the study was explicitly explained to each eligible respondent and verbal consents from the respondents were obtained. Eczema was diagnosed by clinical examination. Documents of the respondents were reviewed for physical and psychological illness diagnosed by the Ayurvedic physicians.

3.11 TABLET AND OINMENT PRODUCTION PROCEDURE OF HERBAL PREPARATION

3.11.1 Cleaning Herbs

Cleaning herbs is an important step for a good quality herbal product. At first in this process raw herbs (Whole herbs or grains) de-dusted through a de-duster machine or manually. By this process large particles with the raw herbs were sorted out easily.

3.11.2 Drying

Drying section took the cleaned raw herbs from the cleaning section. Fluid bed dryer is used to dry the raw herbs. It takes time about 15-20 minutes under 55 to 60 degree centigrade temperature. The moisture range of the dried herbs would be 10 – 14%.

3.11.3 Herbs Crushing

Properly dried raw herbs were crushed and pulverized by a pulverize machine. Then herbs were crushed and pulverized and turn into powder.

3.11.4 Herbs Sieving

Herbs powders sieved through a particular messed net so that the bigger particle of the powder may separate from the total fine powder.

3.11.5 Mixing

Mixing order of any product is very important procedure. Efficacy of that specific product depends on this procedure. For this purpose, some liquid will have to be added (according to formulation) with the powder for proper granulation. The total time consumed more than 25 minutes (according to characteristics of herbs). Then a unique mixture prepared.

3.11.6 Mixed Powder Drying

When the raw powder for a capsule mixed thoroughly some liquid added to complete the procedure. As a result the moisture content raised high than the normal limit. It is mandatory that the moisture limit of the mixed powder will have to be 3-4%.

Table 3.1 Each 10 Gram Tablet Contains

1. Holud (<i>Curcuma longa</i>)	4 g
2. Durva grass (<i>Cynodon dactylon</i>)	2g
3. Neem (<i>Azadirachta Indica</i>)	2g

Table 3.2 Each 10 gram ointment Contains

1. Holud (<i>Curcuma longa</i>)	4% extract
2. Durva grass (<i>Cynodon dactylon</i>)	2% extract
3. Neem (<i>Azadirachta Indica</i>)	2% extract

Table 3.3 Single drug administration

1. Holud (<i>Curcuma longa</i>)	4 mg/kg body wt.
2. Durva grass (<i>Cynodon dactylon</i>)	2 mg/kg body wt.
3. Neem (<i>Azadirachta Indica</i>)	2 mg/kg body wt.

Thus this various preparation was induced to get the scientific efficacy of the single drug and their combined dosages form.

4. RESULTS

A total 160 adult male and female were selected according to the selection criteria. They were interviewed with a specific pre-designed and pre-tested questionnaire and some information were gathered by the review of documents. Collected data were analyzed and presented in this chapter.

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

4.1.1 Age of the Respondents

Table 4.1. shows the age distribution in 4 age groups. 160 populations had an age spectrum between 7 and 75 years, with 34.6 years mean (SD: ± 18.7). Most of the populations were in 21-40 years age group (34.4%).

Table 4.1: Age distribution of the patients.

Age group	Num Year	Percentage
Less than 20 Years	47	29.4
21-40 Years	55	34.4
41-60 Years	48	30.0
61 Years and above	10	6.3
Total	160	100.0

4.1.2 Religion of the Respondents

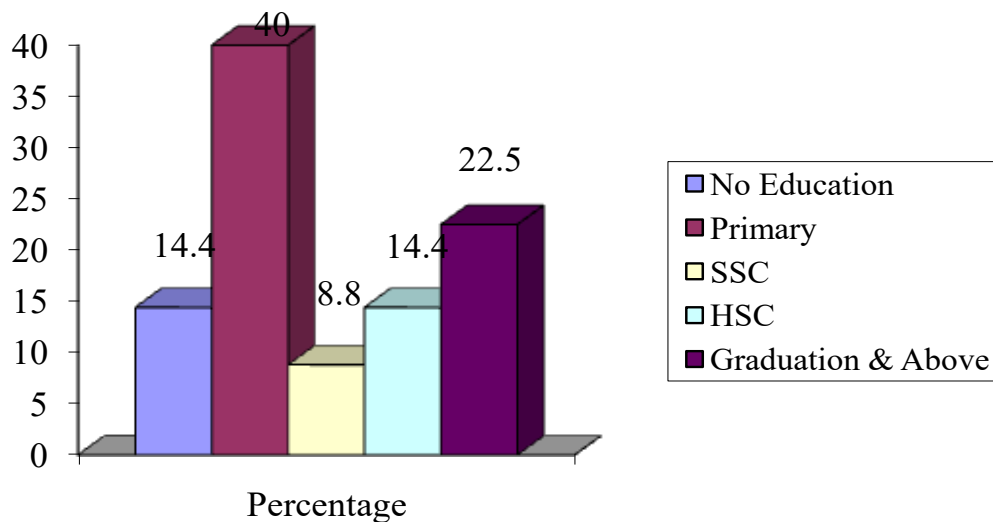
Table 4.2 shows that distribution of religion. Religions of the majority of populations were Islam (98.10%) and rest of the populations was Hindu.

Table 4.2: Distribution of religion of the patients.

Religion	Number	Percentage
Muslim	157	98.1
Hindu	3	1.9
Total	160	100.0

4.1.3 Level of Education of the Patients

Figure 4.1 shows that 14.4 % were illiterates, 40.0% of populations had primary education, 8.8% had had secondary, 14.4% had higher secondary and 22.5% had graduation and above education.

**Figure 4.1: Distribution of populations according to level of education.**

4.1.4 Occupation of the Patients

Table 4.3 shows the distribution of the patients by occupation. Among them 6.9% were farmer, 25.6% were service, 35.0% were student followed by 30.0% were housewife and only 2.50% were in business.

Table 4.3: Distribution of the patients by occupation.

Occupation	Number	Percentage
Business	4	2.5
Farmer	11	6.9
House wife	48	30.0
Service	41	25.6
Student	56	35.0
Total	160	100.0

4.1.5 Monthly Family Income

Table 4.4 shows the distribution monthly family income. 32.5% had monthly income of less than Tk. 10000.00. 52.5% had monthly income of Tk. 10,001.00 to 20,000.00. and 15% had monthly income of more than Tk. 20,001.00.

Table 4.4: Distribution of monthly family income.

Monthly family income (In Taka)	Number	Percentage
Below Taka 10,000.00	52	32.5
Taka 10,001.00 To 20,000.00	84	52.5
Taka 20001.00 and above	24	15.0
Total	160	100.0

4.1.6 Marital Status

Figure 4.2 shows the distribution of marital status. Among the populations, 55.60% were married and 44.4% were un-married.

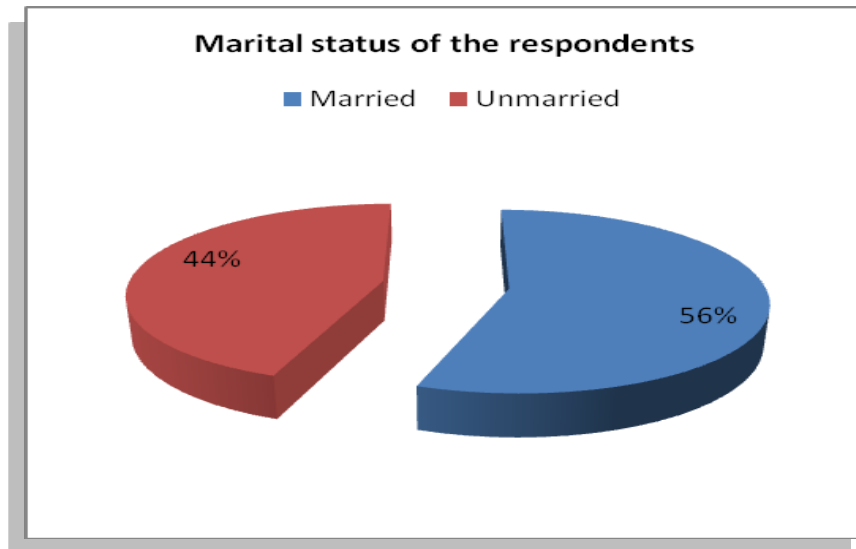


Figure 4.2: Distribution of age of marriage.

4.1.7 Distribution of Gender

Figure 4.3 shows the distribution of gender of populations. 38.8% of the populations were male and 61.2% were female.

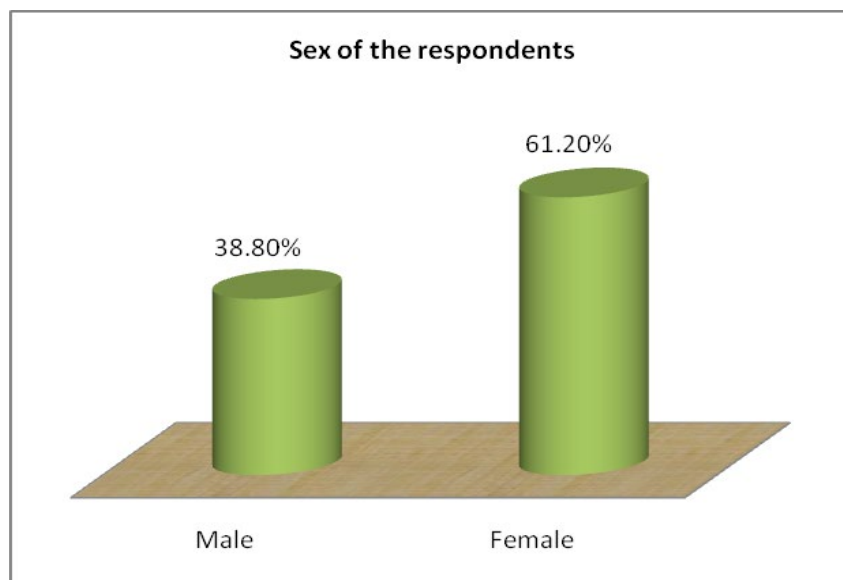


Figure 4.3: Distribution of gender among the study subjects.

4.1.8 Residential Status

The following table shows the distribution of residential status of the study patients. 9.4% were lived in kancha house. Most of the respondents (73.8%) were lived in pakka house.

Table 4.5: Distribution of Residential Status of the patients.

Area	Number	Percentage
Kancha	15	9.4
Pakka	118	73.8
Damp	4	2.5
Tin shed	23	14.4
Total	160	100.0

4.1.9 Characteristics of Residential Area

Table 4.6 shows the distribution of characteristics of residential area. Among the populations, 15.0% residential areas were damp and 85.0% were dry.

Table 4.6: Distribution of residential area.

Family	Number	Percentage
Damp	24	15.0
Dry	136	85.0
Total	160	100.0

4.1.10 Characteristics of Living Status

Table 4.7 shows the distribution of living status of the. 40.6% of the populations lived in single family and joint family had 59.4%.

Table 4.7: Distribution of living status.

Status	Number	Percentage
Single Family	65	40.6
Joint Family	95	59.4
Total	160	100.0

4.1.11 Food Habit of the Patients

The following table shows the distribution of food habit of the respondents. 68.1% study patients liked spicy food and 52.5% liked sweet.

Table 4.8: Distribution of food habit of the patients.

Nature of Food	Habit	Number	Percentage
Sour	Like	57	35.6
	Don't Like	103	64.4
Spicy	Like	109	68.1
	Don't Like	51	31.9
Sweet	Like	84	52.5
	Don't Like	76	47.5
Cold	Like	73	45.6
	Don't Like	87	54.4
Hot	Like	34	21.3
	Don't Like	126	78.8
Oily	Like	38	23.8
	Don't Like	122	76.3

4.1.12 Characteristics of Skin

Table 4.9 shows the distribution of nature of the skin of the patients. 63.8% had dry skin, 30.0% had moist and 37.5% had numbness skin.

Table 4.9: Distribution of characteristics of skin of the patients.

Nature of Food	Habit	Number	Percentage
Dry Skin	Present	102	63.8
	Absent	58	36.3
Moist	Present	48	30.0
	Absent	112	70.0
Numbness	Present	60	37.5
	Absent	100	62.5

4.1.13 Clinical Features of the Patients.

Table 4.10 the following table shows the clinical features of the patients. 5% had insomnia, 65% had constipation, 36.9% had thirsty, 66.3% had pain skin, 38.1% loss of appetite, 14.4% had excessive sedation and 90.6% had itching on lesion site.

Table 4.10: Clinical features of the patients.

Nature of Food	Habit	Number	Percentage
Insomnia	Present	8	5.0
	Absent	152	95.0
Constipation	Present	104	65.0
	Absent	56	35.0
Thirsty	Present	59	36.9
	Absent	101	63.1
Pain	Present	106	66.3
	Absent	54	33.8
Loss of Appetite	Present	61	38.1
	Absent	99	61.9
Excessive Sedation	Present	23	14.4
	Absent	137	85.6
Itching	Present	145	90.6
	Absent	15	9.4

4.1.14 History of Past Illness

HISTORY OF SKIN DISEASE

Table 4.11 shows the history of the skin disease of about 68.6% of the patients had past history of skin diseases.

Table 4.11: History of the skin diseases.

History	Number	Percentage
Yes	110	68.6
No	50	31.4
Total	160	100.0

4.1.15 Types of Past Skin Diseases

Table 4.12 shows the distribution of past skin diseases. 52.5% of the populations suffered from scabies and 12.5% had suffered from eczema.

Table 4.12: Distribution of past skin diseases.

Types	Number	Percentage
No Disease	43	26.8
Scabies	84	52.5
Eczema	20	12.5
Psoriasis	7	4.4
Dandruffs	6	3.8
Total	160	100.0

4.1.16 Treatment Received

Table 4.13 shows the distribution of treatment received by the respondent during their past suffering. 76.2% of the populations received treatment and 23.8% not received treatment.

Table 4.13: Distribution of the treatment received by the respondent.

Types	Number	Percentage
Yes	122	76.2
No	38	23.8
Total	160	100.0

4.1.17 Pattern of Treatment

Table 4.14 shows the distribution of pattern of treatment received by the respondent. 18.1% of the populations received Ayurvedic treatment, 7.5% Unani, 10% Homeopathic, 7.5% Homeo and Allopathic, 33.1% Allopathic treatment had received and 23.8% had not received any treatment.

Table 4.14: Distribution of pattern of treatment received.

Types	Number	Percentage
Ayurvedic	29	18.1
Unani	12	7.5
Allopathic	53	33.1
Homeopathic	16	10.0
Homeo & Allopathic	12	7.5
No	38	23.8
Total	160	100.0

4.1.18 Family History

Table 4.15 shows the pattern of family history among the respondent. 18.8% mothers of the respondent had positive family history and 46.3% had not such history.

Table 4.15: Family history of Eczema among the study subjects

Types	Number	Percentage
Brother	6	3.8
Father	10	6.3
Grand Mother	4	2.5
Mother	30	18.8
Mother & Brother	6	3.8
Mother & Sister	7	4.4
Mother, Sister and Brother	8	5.0
No family history	74	46.0
Sister	15	9.4
Total	160	100.0

4.1.19 Clinical Findings

Table 4.16 shows the clinical findings of the respondents. 28.1% respondents were anaemic.

Table 4.16: Clinical findings of the respondents.

Clinical findings	Present	Number	Percentage
Anaemia	Yes	45	28.1
	No	115	71.9

4.1.20 Affected Area of the Body

Table 4.17 shows the affected area of the body of the respondents. Majority 11.9% respondents were affected their hand and foot.

Table 4.17: Distribution of Affected Area

Area of the body	Number	Percentage
Chest and Back	3	1.9
Ear	7	4.4
Elbow & knee	3	1.9
Foot	7	4.4
Foot & Buttock	6	3.8
Foot, Knee, Waist	11	6.9
Great Toe	16	10.0
Hand	10	6.3
Hand & Back	7	4.4
Hand, Foot	19	11.9
Knee	18	11.3
Leg & Foot	3	1.9
Lower Abdomen	10	6.3
Neck	7	4.4
Sole of the foot	4	2.5
Thumb	3	1.9
Waist	10	6.3
Waist & Foot	9	5.6
Waist & Lower Abdomen	7	4.4
Total	160	100.0

4.1.21 Clinical Findings of the Patients

Table 4.18 shows the mean, std. deviation, minimum and maximum values of height, weight, blood pressure and pulse rate of the respondents.

Table 4.18: Anthropometric measurement, Blood pressure and Pulse (Mean, SD)

Variables	Height in CM	Weight in KG	Systolic BP mmHg	Diastolic BP mmHg	Pulse Beat/minute
Mean	150.14	52.79	116.28	75.13	71.28
Std. Deviation	23.922	11.260	14.141	9.902	7.053
Minimum	81	20	90	60	55
Maximum	177	68	170	100	92

4.1.22 Taking Medicine Regularly

Figure 4.4 shows 78.8% respondents received medicine regularly and 21.30% not received medicine regularly.

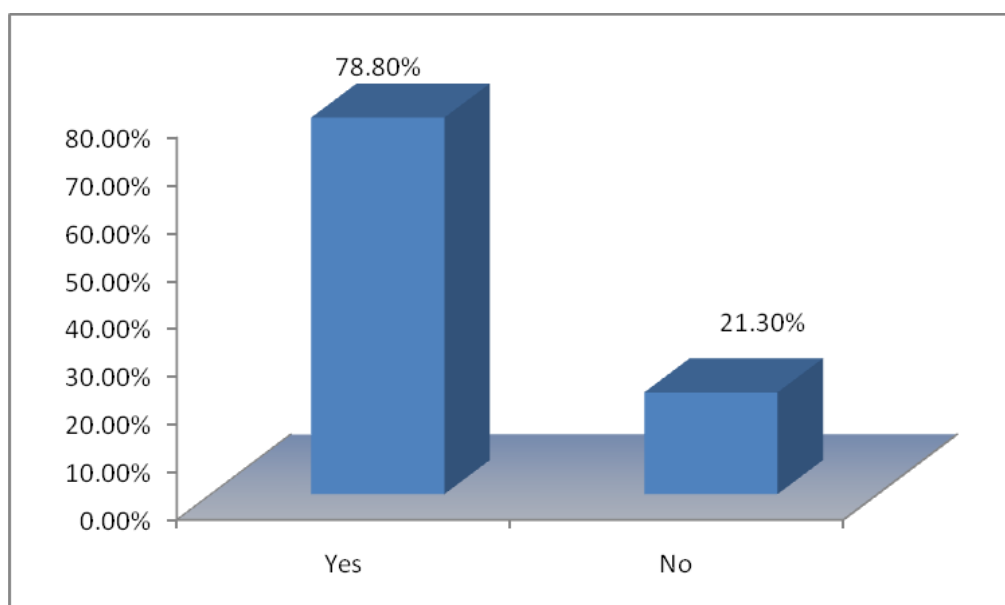


Figure 4.4: Taking Medicine Regularly.

4.1.22.1 Summary

In this chapter use of different socio-demographic characteristics for the treatment of eczema have been discussed. The rural peoples are out of reach of systematic treatment. It is also found that most of the people were in 21-40 years age group (34.4%), Muslim (98.1%), students (35%), monthly family income within 10001/- to 20000/-, married person (55.60%), female (61.20%), lived in paka house (73.8%), dry house (85%), joint family (59.4%), liked spicy food (68.1%), dry skin (63.8%), history of skin diseases (68.6%). Many factors are involved to access traditional healthcare practices in the treatment of eczema of rural areas like, lack of communication facilities, lack of trained doctors and proper medicine. The most of patients have adjusted their healthcare practices to their socio-economic behavior over generations. They do not have only one way of options in their treatment.

4.1.23. Use of Medicinal Plans

Traditional healthcare practices of human beings largely depend on plants and plant products. It is evident that plant based traditional medicine have been used by rural people since ancient period and once it was the only key to the ailment of diseases of rural people. Traditional system of medicine derived from plants and plant material used by different communities are placed behind due to the development of modern medicine which is mainly based on synthetic products. The people of the study area use different plants and plant product for the eczema. They are also deprived of modern medicine. Therefore, they use plants and plant products for ailment of illness of human beings. This chapter discusses the comparative study of medicinal plants which were used locally and oral preparation on Eczema and allopathic medicine.

4.1.24 *Curcuma longa* (Holud)

4.1.24.1 Comparative study

It has been felt worldwide that an eczema patient needs an integrated approach towards the management of the overall health condition this is because other skin diseases viz. scabies, purities, lowering efficacy of circulatory eosinophil, constipation, sluggish liver, indigestion, neuropathy and obesity.

The experiment was conducted to investigate the role of herbs *Curcuma longa* (Holud) in Eczema patients. Attempts were also made to study the comparative efficacy of this *Curcuma longa* (Holud) and allopathic drugs (like 1. Local: Clobetasol propionate 0.05%:- Dermovate ointment/cream. 2. Systemic medicine: Antibiotic: - Cloxacillin) on Eczema and some of these have proved remarkable for remedy of eczema.

4.1.24.2 For male (7-75)

To perform the experiment, 80 male subjects within 7 to 75 years aged were randomly divided into 4 equal groups. One group was kept as normal control group and other three groups were treated with *Curcuma longa* (Holud) or allopathic drugs. After fourteen days among them, one group were kept as eczema control group without giving any other treatment and remaining two groups were treated with *Curcuma longa* (Holud) and allopathic drugs, respectively. Then signs and symptom of eczema and others complication (measured by physical test, laboratory test and verbal history of the subjects) of all groups were measured.

Table 4.19: Effect of *Curcuma longa* (Holud) and allopathic drugs table on Eczema in normal and Male Eczema patients.

Dosage: Standardized powder (*Curcuma longa* (Holud): 7 - 8 mg/kg body weight 3 times per day.

Table 4.19: Significantly deteriorate or improved the condition of eczema.

Group	Drug, dose and route	0 day	4 weeks	12 weeks
A	Normal control	10	10 NS	10 NS
B	Eczema Control	13.2±0.5	14.3±0.8β	15±0.2 β
C	<i>Curcuma longa</i>	13.4±0.9	12±0.6 α	11.0±0.2α
D	Synthetic drugs	13.99±0.80	12.97±0.28 α	10.85±0.86 α

α = Significantly improved;

β = Significantly deteriorate;

NS = Non significant improved/deteriorate;

Number "10" = Non Significant condition;

Significantly the condition of patient was improved, when number "10" is decreases;

significantly the condition of patient was deteriorated, when number "10" is increases.

Figure 4.5: Effect of *Curcuma longa* (Holud) and allopathic drugs on eczema in normal and male eczema patients.

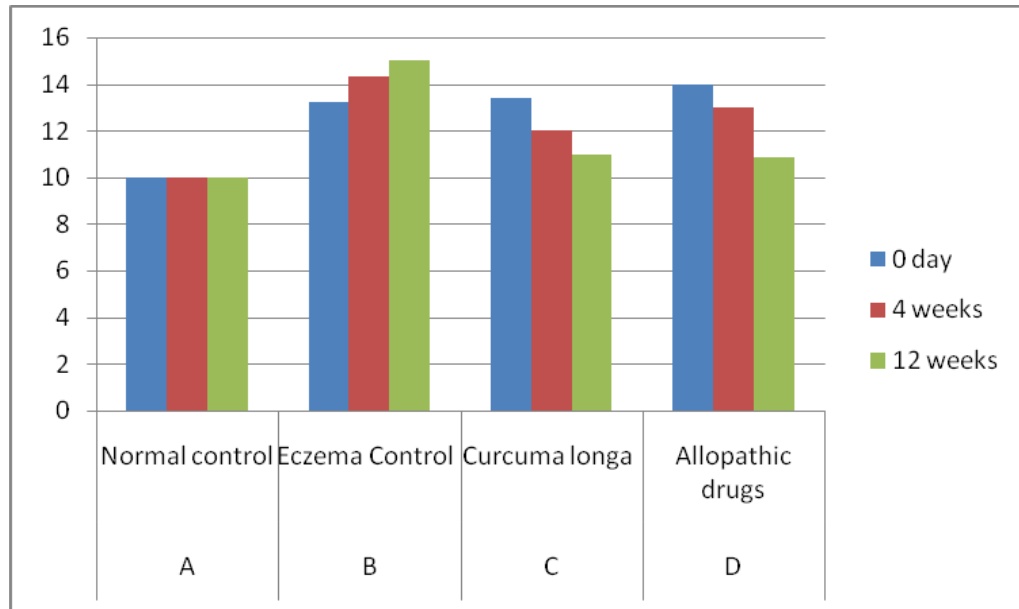


Figure 4.5: Effect of *Curcuma longa* (Holud) and allopathic drugs.

From Table 20: It was observed that the control group of the subjects, mean value of point level is 10 and the eczema control group has 14.16. There was significant effect among all the treatments applied. After the administration of *Curcuma longa* (Holud) there was significantly improved in the conditions of eczema. On the other hand the allopathic drug significantly improved the conditions of patient.

According to ranked order the effective groups towards the conditions of patient are control > Allopathic drugs > Turmeric > Eczema control.

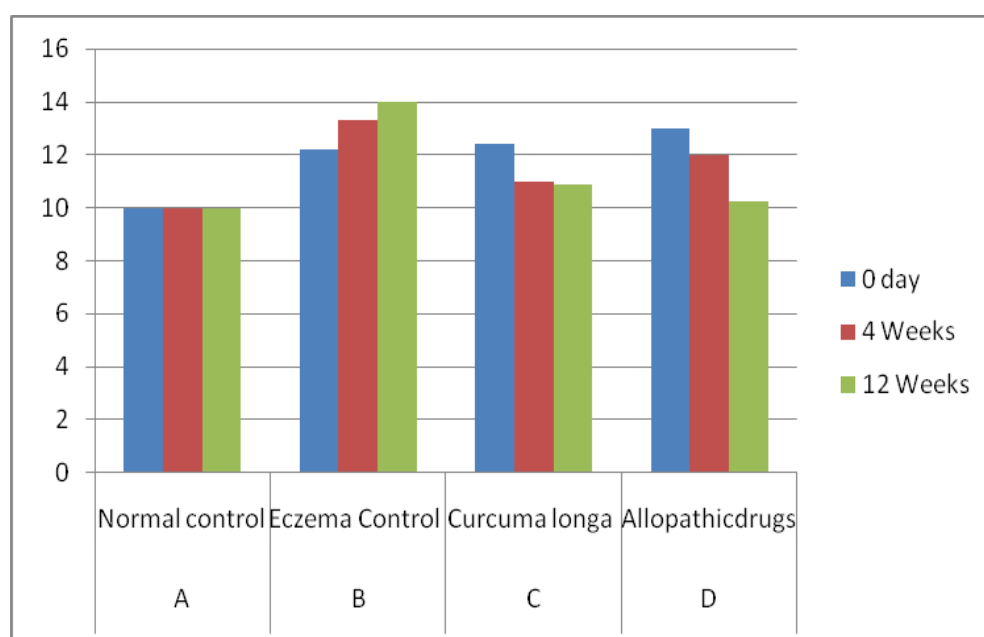
Table 4.20: Effect of *Curcuma longa* (Holud) and allopathic drugs on eczema in normal and Female Eczema patients.

Dosage: Standardized powder *Curcuma longa* (Holud): 7 - 8 mg/kg body weight 3 times per day.

Table 4.20: Significantly deteriorate or improved the condition of eczema.

Group	Drug, dose and route	0 day	4 Weeks	12 Weeks
A	Normal control	10	10 NS	10 NS
B	Eczema Control	12.2±0.5	13.3±0.8 β	14±0.2 β
C	<i>Curcuma longa</i>	12.4±0.9	11±0.6 α	10.9±0.2 α
D	Synthetic drugs	12.99±0.80	11.97±0.28 α	10.25±0.86 α

Figure 4.6: Effect of *Curcuma longa* (Holud) and allopathic drugs table on Eczema in normal and Female Eczema patients.



From Figure 4.6: It is observed that the control group of the subjects, mean value of point level is 10 and the Eczema control group has 13.16. There was significant effect among all the treatments applied. After the administration of *Curcuma longa* (Holud) there was significantly decreased the signs and symptoms of patient. On the other hand the Allopathic drug significantly decreased the condition of patient.

According to ranked order the effective groups towards the condition of patient are control > Allopathic drugs > Turmeric > Eczema control.

4.1.25 Disease Status after Subsequent Follow-up During the Treatment by *Curcuma longa* (Holud)

Almost all of the patients 83.1% improved during their courses of treatments. After third follow-up conditions deteriorate 4.4% respondents and 5.0% fully cured. Due to the failure of coming at follow-up, the condition of few respondents could not be evaluated.

Table 4.21: The percentage of deteriorate, improve and cure the condition of eczema.

Progress	First Follow-up		Second Follow-up		Third Follow-up	
	Number	Percent	Number	Percent	Number	Percent
Improved	149	93.1	141	88.1	133	83.1
Deteriorate	7	4.4	8	5.0	7	4.4
Cure	0	0.0	0	0.0	8	5.0
Not known	4	2.5	11	6.9	12	7.5
Total	160	100	160	100	160	100

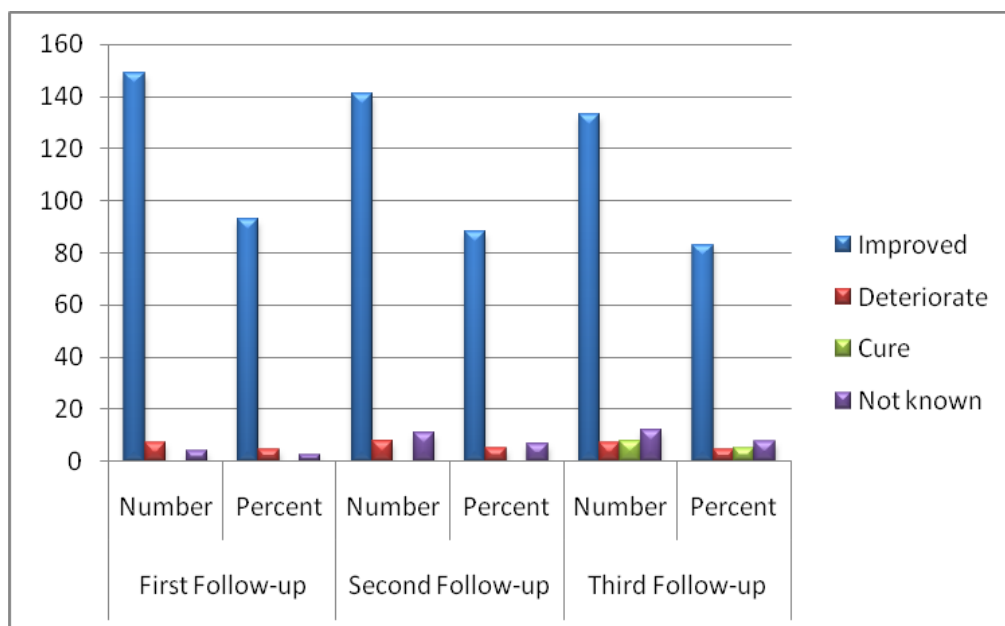


Figure 4.7: Disease Status

Thus, *Curcuma longa* is useful in the management of eczema by enhancing the continuity of the epidermis through its protective and antioxidant functions. It also controls the inflammation induced skin damage by inhibiting inflammatory cytokines. In addition *Curcuma longa* helps in countering the effects of stress and immune dysfunctions—factors which are now being recognized as important contributors to the etiology of eczema.

4.1.26 *Cynodon dactylon* (Durva Grass)

This is also one of the live examples that each and every ritual in ancient Hinduism is not only of spiritual significance but also have the significance in our material life too. Since the ancient times in Hindu rituals, the durva grass plays an important role. Rings made of the grass are often worn before starting either the ritual of homa offerings to fire and puja. The grass is believed to have a purifying effect on participants. Grass is also used as an offering in Ganesha temples.

Use of durva grass in Hindu rituals began in Vedic times, more than estimated thousands of years ago. The grass is variously known as kusha and durva. Scholars and priests are not clear if they refer to two separate species of grass or the same grass. Some of the species of grass identified as sacred grass include *Cynodon dactylon*, *Desmostachya bipinnata*, *Imperata cylindrica* and *Panicum dactylon*.

4.1.26.1 Features of durva

The unique feature of kusha grass is that it has sharp edges and that of durva grass is that it is a hardy plant and, therefore, is a great survivor; its roots go deep in search of water. Pluck a blade of grass and it sprouts back, and this attribute makes it a powerful symbol of regeneration, renewal, rebirth, fertility, and hence prosperity. That is why the durva grass is offered to householder gods like Ganesha, and not to hermit gods like Shiva.

4.1.27 Ancient Scriptures on Durva

Some Scholars say the durva grass represents the hair of Brahma; others say it is the hair of Vishnu. In one folk variant of the Ramayana, it is the hair of Sita as Sita entered the earth, a distraught Rama tried to hold on to her but could only catch a few strands of her hair and these turned into kusha grass whose sharp edges cut his fingers.

- Sita is said to have placed the sacred grass between herself and Ravana during the period of her confinement in Lanka, and she warned him never to cross the grass. If he did, his head would burst into a thousand pieces, she told him. This makes the grass the Sita-rekha that prevents Ravana from crossing the line of propriety with the faithful wife of Rama.

- Another folk narrative says that Sita gave birth to only one son called Luv. One day, she left the child in the care of sage Valmiki and went to the forest to collect firewood. While she was away, the child wandered off. Valmiki, not finding the child, became tense. He fashioned a doll out of some kusha grass and using his divine powers, created another like Luv, and that's how Luv came to have a twin brother, Khush.
- Blades of the razor-sharp grass have been converted by rishis into potent missiles to kill demons and errant kings. Rishis created a missile using kusha grass to kill the wicked king Vena.
- Some say that the durva grass became sacred when drops of amrita or nectar fell on it during the churning of the cosmic ocean. Another story tells us that the pot containing amrita was placed on kusha grass and that's how it came to be considered immortal.

4.1.28 Medicinal Benefits of Durva Grass

Durva grass or Bermuda grass or (*Cynodan dactylon*) is widely used in this subcontinent for grass juice, an excellent remedy for many diseases. Bermuda grass is an indigenous plant of Asia and is superior to wheat grass. It contains crude protein, fiber, calcium, phosphorus and potash.

1) Bermuda grass is alkaline and helps our health: Most of the food we take are acidic and spoil our health. Grass is an alkaline food which is good for our health. This reduces acidity.

2) Tones up nerves: It is a very good tonic for our health and tones up our nervous system. It is suitable for all ages. Begin with a small quantity as in the initial stage you may feel slightly uneasy.

3) Removes toxins from the body: Constipation is the father of diseases. Grass juice is very good for removing the toxins from your body. It cleanses the blood system.

4.1.29 Comparative Study

It has been felt worldwide that an eczema patient needs an integrated approach towards management of the overall health condition associated with eczema viz. scabies, purities, lowering efficacy of circulatory eosinophil, constipation, sluggish liver, indigestion, neuropathy and obesity.

The experiment was conducted to investigate the herbs *Cynodon dactylon* (Durva grass) in eczema patients. Attempts were also to study the comparative efficacy of this *Cynodon dactylon* (Durva grass) and allopathic drugs (like 1. Local: Clobetasol propionate 0.05%:- Dermovate ointment/cream. 2. Systemic medicine: Antibiotic: - Cloxacillin) on eczema and some of these have proved remarkable for cure of eczema and its complications and symptoms.

FOR MALE (7-75)

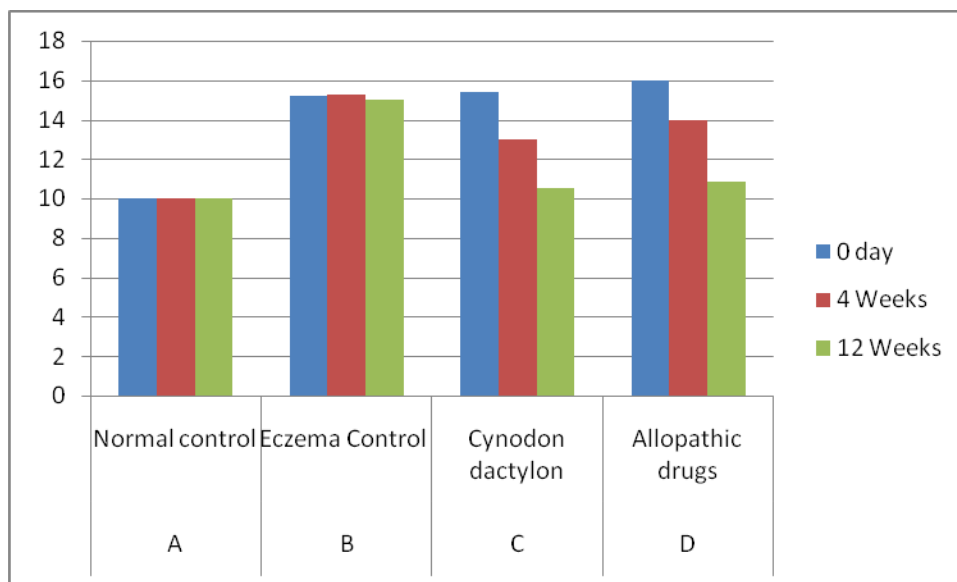
Table 4.22: Effect of *Cynodon dactylon* (Durva grass) and allopathic drugs on eczema in normal and male eczema patients.

Dosage: Standardized powder *Cynodon dactylon* (Durva grass): 3 - 4 mg/kg body weight 3 times per day.

Table 4.22: Group-C and group-D significantly improved the condition of eczema.

Group	Drug, dose and route	0 day	4 Weeks	12 Weeks
A	Normal control	10	10 NS	10 NS
B	Eczema Control	15.2±0.5	15.3±0.8 β	15±0.2 β
C	<i>Cynodon dactylon</i>	15.4±0.9	13±0.6 α	10.5±0.2 α
D	Allopathic drugs	15.99±0.80	13.97±0.28 α	10.85±0.86 α

Figure 4.8: Effect of *Cynodon dactylon* (durva grass) and allopathic drugs on eczema in normal and male eczema patients.



From Figure 4.8: It is observed that the control group of subjects, mean value of point level is 10 and the eczema control group has 15.16. There is significant effect among all the treatments applied. After the administration of *Cynodon dactylon* (Durva grass) there was significantly improved the conditions of eczema. On the other hand the Allopathic drug significantly improved the conditions of eczema.

According to ranked order the effective groups towards the conditions of eczema are control > Allopathic drugs > Turmeric > Eczema control.

FOR FEMALE (7-75)

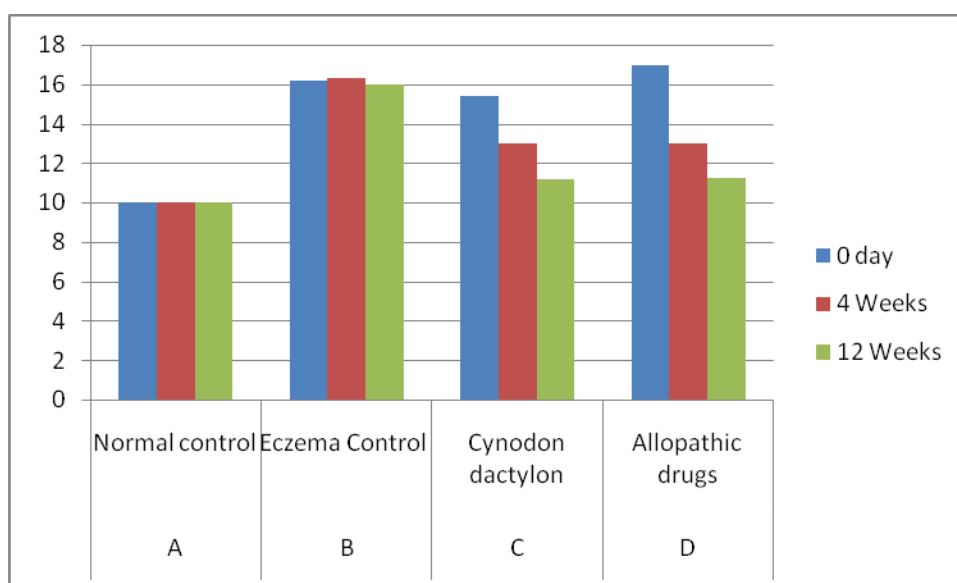
Table 4.23: Effect of *Cynodon dactylon* (Durva grass) and allopathic drugs on eczema in normal and female eczema patients.

Dosage: Standardized powder *Cynodon dactylon* (Durva grass): 3 -5 mg/kg body weight 3 times per day.

Table 4.23: Group-C and group-D significantly improved the condition of eczema.

Group	Drug, dose and route	0 day	4 Weeks	12 Weeks
A	Normal control	10	10 NS	10 NS
B	Eczema Control	16.2±0.5	16.3±0.8 β	16±0.2 β
C	<i>Cynodon dactylon</i>	15.4±0.9	13±0.6 α	11.2±0.2 α
D	Allopathic drugs	16.99±0.80	12.97±0.28 α	11.25±0.86 α

Figure 4.9: Effect of *Cynodon dactylon* (Durva grass) and allopathic drugs on eczema in normal and female eczema patients.



From Figure 4.9: It is observed that the control group of subjects, mean value of point level is 10 and the eczema control group has 16.16. There is significant effect among all the treatments applied. After the administration of *Cynodon dactylon* (Durva grass) there was significantly decreased the signs and symptoms of eczema. On the other hand the Allopathic drug significantly improved the conditions of eczema.

According to ranked order the effective groups towards the condition of eczema are control > allopathic drugs > turmeric > eczema control.

4.1.30 Disease Status after Subsequent Follow-up During the Treatment by *Cynodon dactylon* (Durva grass)

Table 4.24 shows almost all of the patients 82.5% improved during their course of treatment. After third follow-up conditions deteriorate in 3.75% respondent and 6.25% fully cured. Due to failure of coming at follow-up, the condition of few respondents could not be evaluated.

Table 4.24: Disease Status

Progress	First Follow-up		Second Follow-up		Third Follow-up	
	Number	Percent	Number	Percent	Number	Percent
Improved	139	86.87	135	84.37	132	82.5
Deteriorate	8	5	7	4.37	6	3.75
Cure	0	0.0	0	0.0	10	6.25
Not known	13	8.12	18	11.25	12	7.5
Total	160	100	160	100	160	100

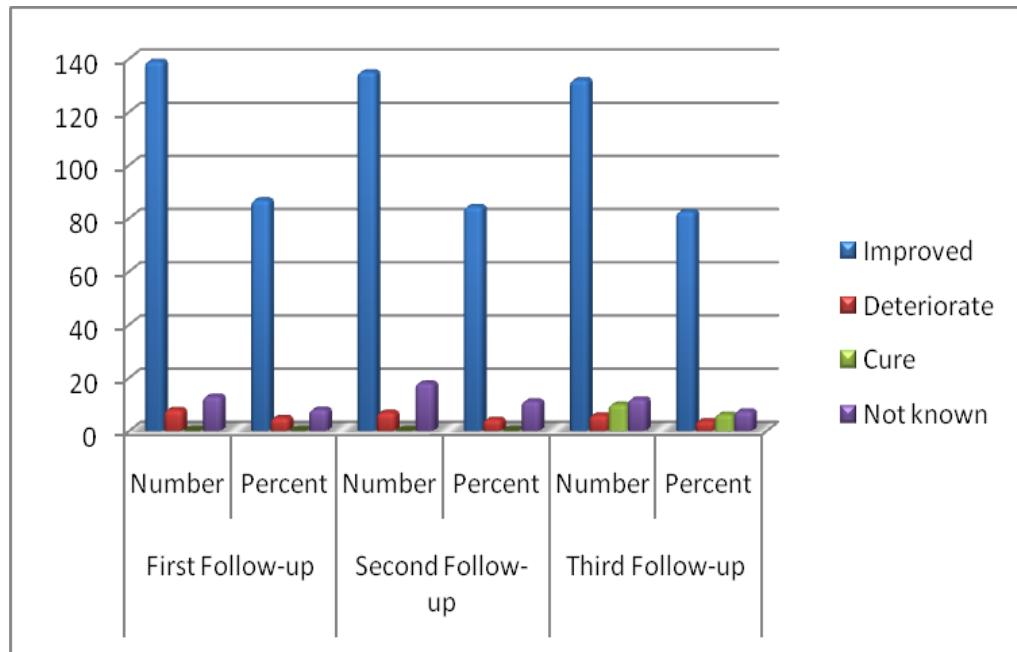


Figure 4.10: Disease Status

Thus, *Cynodon dactylon* (Durva grass) is useful in the management of eczema by enhancing the continuity of the epidermis through its protective and antioxidant functions. It also controls the inflammation induced skin damage by inhibiting inflammatory cytokines. In addition, *Cynodon dactylon* (Durva grass) helps in countering the effects of stress and immune dysfunctions factors which are now being recognized as important contributors to the etiology of eczema.

4.1.31 *Azadirachta indica* (Neem)

4.1.31.1 Clinical trial

It has been felt worldwide that an eczema patient needs an integrated approach towards management of the overall health condition associated with eczema, purities, lowering efficacy of circulatory eosinophil, sluggish liver, indigestion, and obesity.

The experiment was conducted to investigate the herbs *Azadirachta Indica* (Neem) in eczema patients. Attempts were also to study the comparative efficacy of this *Azadirachta Indica* (Neem) and allopathic drugs (like 1. Local: Clobetasol propionate 0.05%:- Dermovate ointment/cream. 2. Systemic medicine: Antibiotic: - Cloxacillin) on eczema and some of these have proved remarkable for cure of eczema and its complications.

FOR MALE (7-75)

To perform the experiment, 80 male subjects within 7 to 75 years aged were randomly divided into 4 equal groups. One group was kept as normal control group and other three groups were treated with *Azadirachta Indica* (Neem) or allopathic drugs. After fourteen days among them one group were kept as eczema control group without giving any other treatment and remaining two groups were treated with *Azadirachta Indica* (Neem) and allopathic drugs respectively. Then signs and symptom of eczema and other complications (measured by physical test, laboratory test and verbal history of subjects) of all groups were measured.

Table 4.25: Effect of *Azadirachta Indica* (Neem) and allopathic drugs on eczema in normal and male eczema patients.

Dosage: Standardized powder *Azadirachta Indica* (Neem): 3 - 4 mg/kg body weight 3 times per day.

Table 4.25 Shows group-C and group-D significantly improved the condition of eczema.

Group	Drug, dose and route	0 day	4 Weeks	12 Weeks
A	Normal control	10	10 NS	10 NS
B	Eczema Control	12.2±0.5	13.3±0.8 β	13.3±0.2 β
C	<i>Azadirachta Indica</i>	13.4±0.9	11±0.6 α	10.5±0.2 α
D	Allopathic drugs	13.99±0.80	11.97±0.28 α	10.05±0.86 α

Figure 4.11: Effect of *Azadirachta indica* (Neem) and allopathic drugs on eczema in normal and male eczema patients.

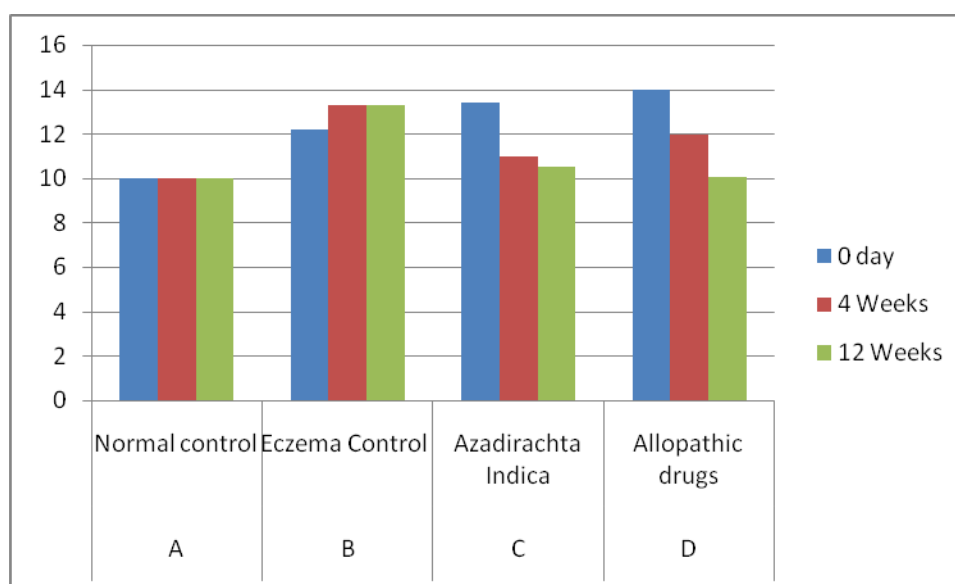


Figure 4.11 : Disease Status

From Figure 4.11: It is observed that the control group of subjects, mean value of point level is 10 and the Eczema control group has 12.93. There is significant effect among all the treatments applied. After the administration of *Azadirachta indica* (Neem) there was significantly improved the conditions of eczema. On the other hand the Allopathic drug significantly improved the conditions of eczema.

According to ranked order the effective groups towards the conditions of eczema are control > allopathic drugs > turmeric > eczema control.

FOR FEMALE (7-75)

Table 4.26: Effect of *Azadirachta indica* (Neem) and allopathic drugs on eczema in normal and female eczema patients.

Dosage: Standardized powder *Azadirachta indica* (Neem): 3 -5 mg/kg body weight 3 times per day.

Table 4.26 Shows group-C and group-D significantly improved the condition of eczema.

Group	Drug, dose and route	0 day	4 Weeks	12 Weeks
A	Normal control	10	10 NS	10 NS
B	Eczema Control	14.2±0.5	14.3±0.8 β	15±0.2 β
C	<i>Azadirachta indica</i>	13.4±0.9	12±0.6 α	11.0±0.2 α
D	Allopathic drugs	13.99±0.80	11.97±0.28 α	10.25±0.86 α

Figure 4.12: Effect of *Azadirachta indica* (Neem) and allopathic drugs on eczema in normal and female eczema patients.

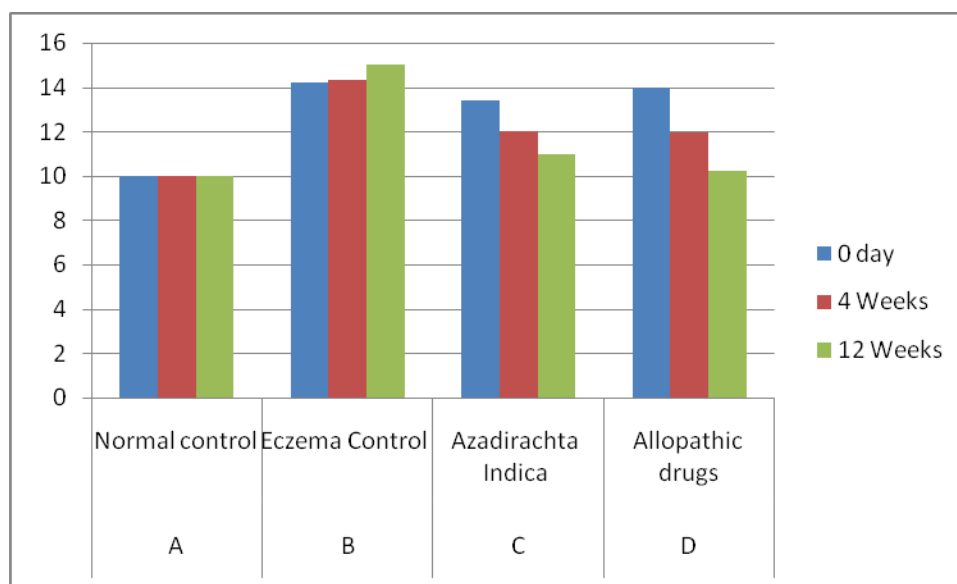


Figure 4.12: Disease Status

From Figure 4.12: It is observed that the control group of subjects, mean value of point level is 10 and the Eczema control group has 14.5. There is significant effect among all the treatments applied. After the administration of *Azadirachta indica* (Neem) there was significantly decreased the signs and symptoms of eczema. On the other hand the allopathic drug significantly decreased the condition of eczema.

According to ranked order the effective groups towards the condition of Eczema are control > allopathic drugs > turmeric > eczema control.

4.1.32 Disease Status after Subsequent Follow-up During the Treatment by *Azadirachta indica* (Neem)

Table 4.27 shows almost all of the patients 87.5% improved during their course of treatment. After third follow-up conditions deteriorate in 3.12% respondent and 8.75% fully cured. Due to failure of coming at follow-up, the condition of few respondents could not be evaluated.

Table 4.27: Disease Status after Subsequent Follow-up During the Treatment by *Azadirachta indica* (Neem)

Progress	First Follow-up		Second Follow-up		Third Follow-up	
	Number	Percent	Number	Percent	Number	Percent
Improved	142	88.75	139	86.87	140	87.5
Deteriorate	5	3.12	7	4.37	5	3.12
Cure	0	0.0	0	0.0	14	8.75
Not known	13	8.12	14	8.75	1	0.63
Total	160	100	160	100	160	100

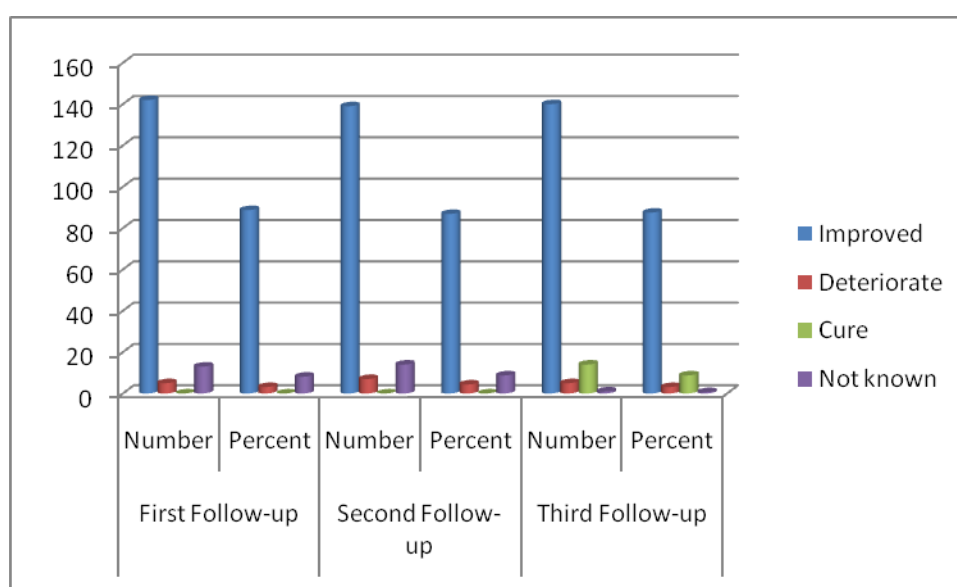


Figure 4.13: Disease Status

Thus, *Azadirachta Indica* (Neem) is useful in the management of eczema by enhancing the continuity of the epidermis through its protective and antioxidant functions. It also controls the inflammation induced skin damage by inhibiting inflammatory cytokines. In addition, *Azadirachta Indica* (Neem) helps in countering the effects of stress and immune dysfunctions factors which are now being recognized as important contributors to the etiology of eczema.

4.1.33 Trial on Eczema by Combined Herbal Preparation (Oral + Local Applicable)

After getting the approval of the research proposal from the honorable faculty members, ethical permission was taken from Rajshahi University Ethical Review Committee for data collection. Consent was received from each individual prior to inclusion. They were informed of their right to withdraw from the study at any stage. Assurance had given that the data collected anonymously and the confidentiality concerning their information was maintained strictly. The research was conducted in full accord with ethical principles. During the study 160 populations were interviewed. Data are presented and analyzed according to objectives. The findings are presented through tables, graphs and organized as below:

During the study 160 populations were interviewed. This was a 12-week, open labeled study of Combined Herbal Preparation (tablet & ointment). Patients received Combined Herbal Preparation (tablet) for 12 weeks and Combined Herbal Preparation (ointment) to be applied over the affected areas thrice daily. Efficacy was evaluated on the basis of parameters of modified eczema area sensitivity index (EASI) and physician's and patient's global evaluation at follow-up visits. 149 patients completed the study with reduction in symptoms of eczema to varying degrees.

An interventional follow up study was conducted to find out the role of Ayurvedic medicine in the treatment of eczema and socio-demographic characteristics of the respondents and attributes associated with the role of Ayurvedic medicine in the treatment of eczema.

4.1.34 Clinical Trial of Combined Herbalpreparation

1. Oral Preparation:

Table 4.28: Shows the quantity single herb.

Name of Herbs	Qty. when it combined drug	Qty. when it single herbs
<i>Curcuma longa</i> (Holud)	4mg/kg Body weight	8mg/kg body wt.
<i>Cynodon dactylon</i> (Durva grass)	2mg/kg Body weight	4mg/kg body wt
<i>Azadirachta indica</i> (Neem)	2mg/kg Body weight	4mg/kg body wt
Excipients	Q.S	

2. Local Applicable Preparation:

Table 4.29 shows contain of ointment.

Name of Herbs	Qty. When it combined drug
<i>Curcuma longa</i> (Holud)	4%
<i>Cynodon dactylon</i> (Durva grass)	2%
<i>Azadirachta indica</i> (Neem)	2%
<i>Banzoaic acid</i>	1%
Vaseline	1kg

Table 4.30 shows contain of each 680mg tablet.

Combined Herbal Preparation		
SL	INGREDIENTS	Qty / Tablet
1	<i>Curcuma longa</i> (Holud)	260 mg
2	<i>Cynodon dactylon</i> (Durva grass)	130 mg
3	<i>Azadirachta indica</i> (Neem)	130 mg
4	Starch Maiz B.P	100 mg
5	Gelatin	5.50mg
6	Gum Accacia	10.0mg
7	Mag.Carb	11.0mg
8	Cal Carb	22.0mg
9	Sodium Benjoate	3.20mg
10	Cal Lactate	1.20mg
11	Povidone	5.50mg
12	Purified Talk	1.60mg

4.1.35 Production Procedure of Herbal Preparation

4.1.35.1 Cleaning herbs

Cleaning herbs is an important step for a good quality herbal product. At first in this process raw herbs (Whole herbs or grains) will have to de-dust at first through a de-duster machine or manually. By this process large particles with the raw herbs are sorted out easily.

4.1.35.2 Drying

Drying section must take the cleaned raw herbs from the cleaning section. Fluid bed dryer is used to dry the raw herbs. It takes time about 15-20 minutes under 55 to 60 degree centigrade temperature. The moisture range of the dried herbs would be 10 – 14%.

4.3.35.3 Herbs crushing

Properly dried raw herbs are crushed and pulverized by a pulverize machine. Then herbs are crushed and pulverized and turn into powder.

4.1.35.4 Herbs Sieving

Herbs powders have to be sieved through a particular meshed net so that the bigger particle of the powder may separate from the total fine powder.

4.1.35.5 Mixing

Mixing order of any product is very important procedure. Efficacy of that specific product depends on this procedure. For this purpose, some liquid will have to be added (According to formulation) with the powder for proper granulation. The total time will be consumed more than 25 minutes (According to Characteristics of herbs). Then a unique mixture will be prepared.

4.1.35.6 Mixed powder drying

When the raw powder for a capsule mixed thoroughly some liquid are used to complete the procedure. As a result, the moisture content raises high than the normal limit. It is mandatory that the moisture limit of the mixed powder will have to be 3-4%.

4.1.36 Disease Status

Table 4.31 shows almost all of the patients 81.25% improved during their course of treatment. After third follow-up conditions deteriorate in 3.12% respondent and 8.75% fully cured. Due to failure of coming at follow-up, the condition of few respondents could not be evaluated.

Table 4.31: Disease Status

Progress	First Follow-up		Second Follow-up		Third Follow-up	
	Number	Percent	Number	Percent	Number	Percent
Improved	140	87.5	135	84.37	130	81.25
Deteriorate	7	4.37	9	5.62	5	3.12
Cure	0	0	2	1.25	14	8.75
Not known	13	8.12	14	8.75	11	6.87
Total	160	100	160	100	160	100

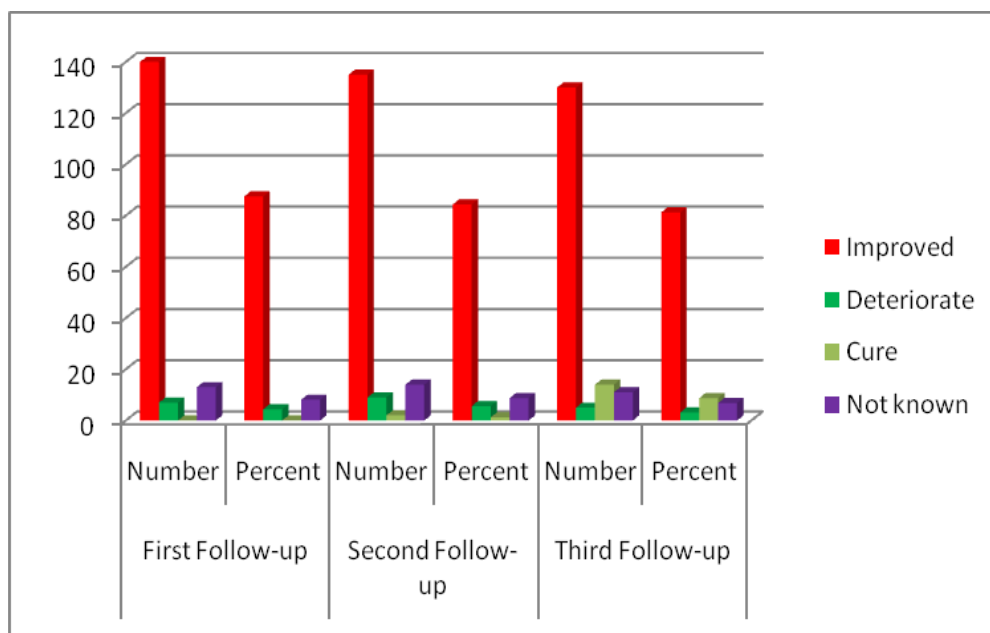


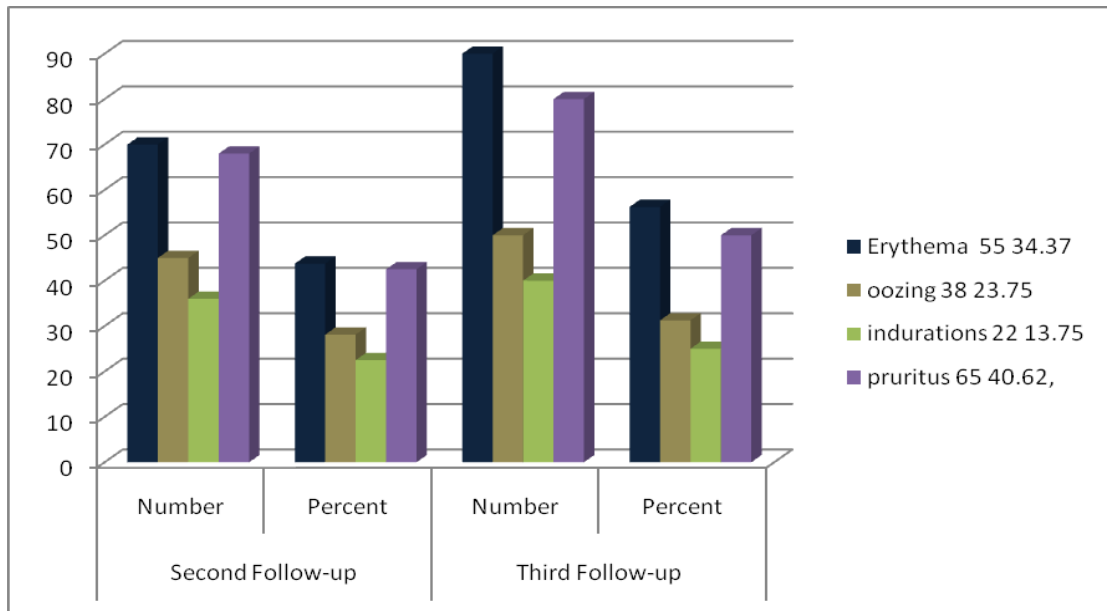
Figure 4.14: Disease Status

4.1.37 Symptom Status

At the end of 4th, 8th and 12th week, mean score of erythema had a reduction of 34.37%, 43.75% and 56.25%, mean score of oozing had a fall of 23.75%, 28.12% and 31.25%, mean score of indurations had a fall of 13.75%, 22.5% and 25%, and mean score of pruritus had a fall of 40.62%, 42.5% and 50%, respectively from baseline. Global assessment by the physicians and patients indicated fair to good response to combined herbal preparation (tablet & ointment). This study confirms the efficacy and safety of combined herbal preparation (tablet & ointment) in Bangladeshi patients with mild to moderate eczema.

Table 4.32: Symptom Status

Progress	First Follow-up		Second Follow-up		Third Follow-up	
	Number	Percent	Number	Percent	Number	Percent
Erythema	55	34.37%,	70	43.75%	90	56.25%
Oozing	38	23.75%,	45	28.12%	50	31.25%
Indurations	22	13.75%,	36	22.5%	40	25%
Pruritus	65	40.62%,	68	42.5%	80	50%

SYMPTOM STATUS**Figure 4.15: Symptom Status**

4.1.38 Follow-up Status

Table 4.33 shows follow-up status of the respondents. Majority of the patients 97.5%, 90.6% and 92.5% came for follow-up respectively in three subsequent visits at the interval of one month.

Table 4.33: Follow-up Status

Follow-up		Number	Percentage
First Follow-up	Yes	156	97.5
	No	4	2.5
Second Follow-up	Yes	145	90.6
	No	15	9.4
Third Follow-up	Yes	148	92.5
	No	12	7.5

4.1.39 Disease Status after Subsequent Follow-up

Table 4.34 shows almost all of the patients 83.1% improved during their course of treatment. After third follow-up conditions deteriorate in 4.4% respondent and 5.0% fully cured. Due to failure of coming at follow-up, the condition of few respondents could not be evaluated.

Table 4.34: Disease Status after Subsequent Follow-up

Progress	First Follow-up		Second Follow-up		Third Follow-up	
	Number	Percent	Number	Percent	Number	Percent
Improved	149	93.1	141	88.1	133	83.1
Deteriorate	7	4.4	8	5.0	7	4.4
Cure	0	0.0	0	0.0	8	5.0
Not known	4	2.5	11	6.9	12	7.5
Total	160	100.0	160	100.0	160	100.0

DISEASE STATUS AFTER SUBSEQUENT FOLLOW-UP



Figure 4.1: Pre-treatment



Figure 4.2: Post-treatment



Figure 4.3: Pre-treatment

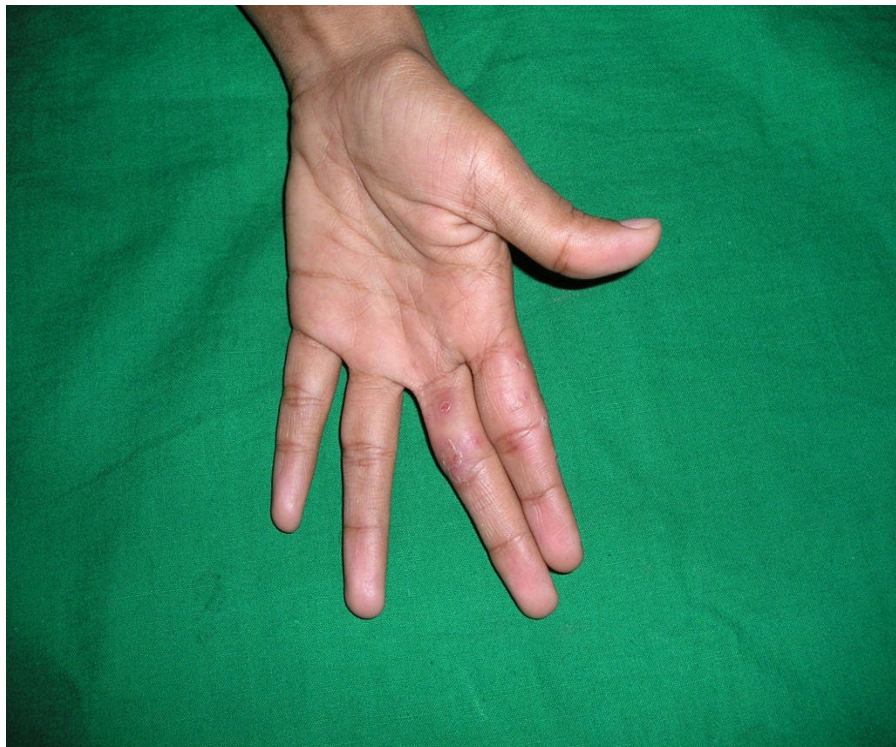


Figure 4.4: Post-treatment

5. DISCUSSION

Eczema shows a wide clinical spectrum ranging from minor forms presented by a few dry eczematous patches to major forms with erythematous rash (Leung, 2003). The exact pathophysiological mechanisms leading to eczema are still elusive and various studies have tried to unravel the key factors leading to this disease.' Nevertheless, continuing research on this disease has provided us with several insights into its pathophysiology. For example, it is now known that eczema is associated with an increased level of IgE (immunoglobulin E) in about 70-80% of the patients. IgE is an antibody subclass (known as "isotypes"), found only in mammals. Although IgE is typically the least abundant isotype, it is capable of triggering the most powerful immune reactions. Most of our knowledge of IgE has come from research into the mechanism of a form of allergy known as type 1 hypersensitivity.

The role of immune dysfunction and inflammatory mediators with respect to eczema has been a subject of intense inquiry. IgE-mediated hypersensitivity reactions are largely regulated by T-lymphocytes and it is generally accepted that the increased prevalence of eczema in recent years is due to a disturbed balance of the cells and the cells with a clear predominance of the cells (Bukantz, 2002). The latter preferentially produce inflammatory mediators such as IL-4, IL-5, IL-10 and IL-13, which induce IgE production and activation of eosinophils, thereby producing typical features of allergic diseases (Schafer and Dockery, 1997).

Disturbances in skin function are also a major etiological factor in eczema. The disease is characterized by intense pruritus and scratching in combination with

cutaneous hyperreactivity and reduced threshold for pruritus. This forms a vicious circle of continuous mechanical stimulation and dysregulated cytokine release by keratinocytes. Further, the lipid composition of the stratum corneum of the epidermis is also damaged in eczema. This leads to dryness of the skin and a higher permeability to allergens and irritants. Thus, eczema can be described as a primary, continuous defect of epidermal differentiation and functions in the presence of subclinical inflammation skin damage in combination with a further impairment of the skin barrier during the active phase of the disease.

In addition to these insights, it is now also being realized that one important triggering factor of the disease is stress. Even though the exact mechanisms of the interaction of the skin immune system and the nervous system have not yet been identified. It is believed that this phenomenon might be mediated by neuroimmunological factors such as neuropeptides, which can be found within the epidermal nerve fibres in close association with epidermal Langerhans cells.

Considering this multifactorial etiology of eczema, it is only logical to expect an encouraging response in this trial to the herbal formulation Takzema. This formulation contains herbal ingredients that attack several pathological mechanisms discussed in the preceding paragraphs. For example, leaves of *Azadirachta indica* and its constituents have been demonstrated to exhibit immunomodulatory, antiinflammatory, antiulcer and antioxidant properties. *Phyllanthus emblica* helps protect the skin from the damaging effects of free radicals, nonradicals and transition metalinduced oxidative stress (Chaudhuri, 2002; Subapriya, 2005).

Curcuminoids from *Curcuma longa* have been demonstrated to protect normal human

keratinocytes from hypoxanthine/xanthine oxidase injury. Plants such as *Rubia cordifolia*, *Glycyrrhiza glabra*, *Berberis aristata* and *Curcuma longa* have been used at Ayurveda for their wound healing properties (Vranaropaka). This property of these plants had been confirmed experimentally. Moreover, these herbs also show anti-inflammatory activity by suppressing reactive oxygen species and proinflammatory cytokines, the two important inflammatory mediators (Biswas, 2003; Jain, 2003). Finally, *Tinospora cordifolia*, in addition to its wellknown effect of regularising WBC function, also differentially regulates the elevation in cytokines.

Thus, Ayurvedic medicine is useful in the management of eczema by enhancing the continuity of the epidermis through its protective and antioxidant functions. In this research it was observed that the control group of the subject, mean value of point level was 10 and the Eczema control group had above 10. There was significant effect among all the treatments applied. After the administration of *Curcuma longa* (Holud) there were significant improvement in the conditions of eczema. On the other hand the Allopathic drug also showed significant improve must in the conditions of Eczema.

One group was kept as normal control group and other three groups were treated with *Azadirachta Indica* (Neem) and allopathic drugs. After fourteen days. The signs and symptom of eczema and other complications (measured by physical test, laboratory test and verbal history of subjects) of all groups were measured. Almost all of the patients 83.1% improved during their course of treatment. After third follow-up conditions deteriorate in 4.4% respondent and 5.0% fully cured. Due to the failure of coming at follow-up, the condition of few respondents could not be evaluated.

5.1 ANTIMICROBIAL EFFICACY TESTS OF THE TOPICAL FORMULATIONS

Antimicrobial activity of the five suggested formulations, commercial products and the negative controls were carried out by a modified agar-well diffusion method (Xu *et al.*, 1996). Present study also shows the anti microbial activity and it may act as the antibiotic and kill the germs. Different socio-demographic characteristics which thought to be linked with the disease for the treatment of eczema have been discussed. The rural peoples are out of reach of systematic treatment. It is also found that most of the people were in 21-40 years age group (34.4%), Muslim (98.1%), students (35%), monthly family income within 10001/- to 20000/-, married person (55.60%), female (61.20%), lived in paka house (73.8%), dry house (85%), joint family (59.4%), liked spicy food (68.1%), dry skin (63.8%), history of skin diseases (68.6%). Many factors are involved to access traditional healthcare practices in the treatment of eczema of rural areas like, lack of communication facilities, lack of trained doctors and proper medicine. Most of the patients have to adjust their healthcare practices to their socio-economic behavior over generations. They do not have only one way of options in their treatment. It was observed that the control group of the subjects, mean value of point level is 10 and the eczema control group has 14.16. There was significant effect among all the treatments applied. After the administration of *Curcuma longa* (Holud) there was significantly improved in the conditions of eczema. On the other hand the allopathic drug significantly improved the conditions of patient in this study.

6. CONCLUSION

The current management of eczema revolves around the use of topical and systemic steroids, antihistamines and soothing and moisturizing agents. Use of steroids (topical and systemic) is fraught with side effects. Antihistamines have practically very little to offer any better result in eczema. Similarly, soothing and moisturizing agents can only offer temporary relief. In this situation, an Ayurvedic formulation appears a promising alternative as it targets the pathophysiology of the disease, is effective and possesses safety profile. This study recommend the efficacy and safety of Ayurvedic medicine and Ointment in Bangladeshi patients with mild to moderate eczema. it is had been proved that using the single ayurvedic drug Holud (*Curcuma longa*) Neem (*Azadirachta indica*) Durva grass (*Cynodon dactylon*) almost all of the patients (81.25%) improved during their course of the treatment. After third follow-up conditions deteriorate in 3.12% respondent and 8.75% fully cured. Thus this research proved the efficacy of above mentioned three medicinal plants and opened a window for further research towards eczema disease.

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