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A SCIENTIFIC RECENT TREND FOR THE MANAGEMENT AND TREATMENT OF FILARIASIS (DAUL FEEL)

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ABSTRACT

Filariasis *(Daul feel)* is the name for a group of tropical diseases caused by various thread like parasite round worms (nematodes) and their larvae. The larvae transmit the disease to humans through a mosquito bite. Filariasis is characterized by fever, chills, headache, and skin lesions in the early stages and if untreated, can progress to include gross enlargement of limbs and genitalia in a condition called elephantiasis, while filariasis is rarely fatal. The infections have a significant economic and psychological impact in endemic areas, disfiguring, as more than 40 million persons worldwide are physically incapacitated and disfigured by chronic lymphatic filariasis, it is also a disease that prevents patients from having a normal working life. Thus, the fight to eliminate lymphatic filariasis is also a fight against poverty. The world Health organization (WHO) has named filariasis one of only six "potentially eradicable" infectious diseases, and has embarked upon a 290 years campaign to eradicate the disease. Strategy for Elimination of Lymphatic Filariasis Lymphatic filariasis seems to be eradicated with the advent of cost-effective control strategies. Hence, the World Health Organization (WHO) launched a Global Programme to Eliminate Lymphatic Filariasis as a public health problem by the year 2020 and India is a signatory to it. India has set its target for national elimination by the year 2015. According to the Unani System of Medicine, this disease cause by the derangement of humours like, *Bulgham, Safra* and *Sauda*. Many Unani drugs have been used in the treatment of *Daul Feel* with very low degree of successes. As no comprehensive drugs are available to supplement such problem.

KEYWORDS: Daul feel, Filariasis, Diethylcarbamazine (DEC), Diagnosis and Prevention.

INTRODUCTION

History of Filariasis

Lymphatic filariasis is thought to have affected humans since approximately 4000 years ago. Africans from ancient Egypt (2000BC) and the Nok civilization in West Africa (5000) show possible elephantiasis symptoms. The first clear reference to the diseases occurs in ancient Greek literature, where scholars differentiated the similar symptoms of lymphatic filariasis from those of leprosy. The first documentation of symptoms occurred in the 16th century, when Jan Huyghen van Linschoten wrote about the disease during the exploration of Goa.

In 1866, Timothy Lewis, building on the work of Jean Nicolas Demarquay and Otto Henry Wucherer, made the connection between microfilariae and elephantiasis, establishing the course of research that would ultimately explain the disease. In 1876, Joseph Bancroft discovered the adult form of the worm. In 1877, the life cycle involving an arthropod vector was theorized by Patrik Mason, who proceeded to demonstrate the presence of the worms in mosquitoes. Manson incorrectly hypothesized that the disease was transmitted through skin contact with vector in which the mosquito had laid egg. In 1900, Gorge Carmichael low determined the actual transmission method by discovering the presence of the worm in the proboscis of the mosquito vector.[1-2]

UNANI CONCEPT OF LYMPHATIC FILARIASIS

Lymphatic filariasis is known as '*Daul Feel'* in Unani system of medicine. *Daul Feel* is defined as a swelling of feet and calf in which the affected leg becomes hugely swollen in advanced stage which resembles the leg of an elephant. Therefore, it is termed *Daul Feel.*

AETIOLOGY

According to Sadidee, *Daul Feel* is caused by abnormal black bile (*Sauda Ghair Tabai)* which is of two types.

1. *Sauda*-e-*Muharreqa*
2. *Sauda*-e-*Balgham*

PATHOGENESIS

Daul Feel is produced by *Soo-e-Mizaj Maddi* in which there is a derangement of humours in the body leading to the production of abnormal *Sauda* which accumulates in the affected part.

This abnormal *Sauda* may be *Sauda-e-Muharreqa* or *Sauda-e-Balghami*. *Balgham-e-Ghaleez* may be converted into *Sauda* which is known as *Sauda-e-Balghami*.

CLINICAL FEATURES: DAUL FEEL DUE TO SAUDA-E-MUHARREQA

Daul Feel caused by *Sauda-e-Muharreqa* is characterized by the following features:

i. Swelling (Oedema) The affected part is swollen.
ii. Skin over the affected part is
- Hot on palpation
- Red in colour.

iii. Fissuring of skin may occur.
iv. Ulceration may occur.
v. Oozing
vi. Pus may ooze from chronic ulceration in the affected part.

DAUL FEEL DUE TO SAUDA-E-BALGHAMI

In this type of disease, the affected part is swollen. The skin over the affected part is usually cold on palpation and the colour of skin remains unchanged. There may be fissuring of skin and formation of ulcers in the affected part. When the disease becomes chronic, the sensation is lost in the affected part.[3-5]

MODERN CONCEPT FOR FILARIASIS (DAUL FEEL)

Filariasis *(Daul feel)* is the name for a group of tropical diseases caused by various thread like parasite round worms (nematodes) and their larvae. The larvae transmit the disease to humans through a mosquito bite. Filariasis is characterized by fever, chills, headache, and skin lesions in the early stages and if untreated, can progress to include gross enlargement of limbs and genitalia in a condition called elephantiasis, while filariasis is rarely fatal.

The infections have a significant economic and psychological impact in endemic areas, disfiguring, as more than 40 million persons worldwide are physically incapacitated and disfigured by chronic lymphatic filariasis, it is also a disease that prevents patients from having a normal working life. Thus, the fight to eliminate lymphatic filariasis is also a fight against poverty.[6]

The world Health organization (WHO) has named filariasis one of only six “potentially eradicable” infectious diseases, and has embarked upon a 290 years campaign to eradicate the

disease. "Strategy for Elimination of Lymphatic Filariasis" Lymphatic filariasis seems to be eradicated with the advent of cost-effective control strategies. Hence, the World Health Organization (WHO) launched a Global Programme to Eliminate Lymphatic Filariasis as a public health problem by the year 2020 and India is a signatory to it. India has set its target for national elimination by the year 2015.[7-9]

CAUSES OF THE FILARIASIS: (LYMPHATIC FILARIASIS)

Mosquitoes of the genera- aedes *Anopheles, Culex,* or *Mansonia* are the intermediate hosts and the vectors of all species that cause lymphatic filariasis. Acute lymphatic filariasis is related to larval molting and adult maturation to fifth stage larvae. Adult worms are found in lymph nodes and lymphatic vessels distal to the nodes. Females measure 80-100 mm in length and male are 40 mm. the most common affected nodes are the femoral and epitrochlear regions. Abscess formation may occur at the nodes or anywhere along the distal vessel. Infection with *B. timori* appears to result in more abscesses than infection with *B.malayi* and *W. bancrofti.*

Cellular invasion, with plasma cells, eosiophils and macrophages, together with hyperplasia of the lymphatic endothelium, occurs with repeated inflammatory episodes. The consequence is lymphatic damage and chronic leakage of protein-rich lymph in the tissues, thickening and verrucous changes of the skin and chronic streptococcal and fungal infections, which all contribute to the appearance of elephantiasis. *B. malayi* elephantiasis is more likely to affect the upper and lower limbs, with genital pathology and chyuria.

Table 1: Lists the parasite and filarial disease caused.

S.No	FILARIAL PARASITE	FILARIAL DISEASE
1.	Onchocerca volvulus	Onchocerciasis
2.	Wuchereria bancrofti	Bancroftian filariasis (lymphatic filariasis)
3.	Brugia malayi and brugia timori	Malayan filariasis (Lymphatic filariasis)
4.	Loa loa	Loiasis
5.	Mansonella species	Mansonelliasis
6.	Dirofilaria species	Dirofilasiasis

Table 2: Filarial infections cause some type of skin problems in addition to systemic manifestations.

S. No	DISEASE	PARASITE	VECTOR
1.	Onchocerciasis	Onchocerca volvulus	Blackflies: Smulium species
2.	Bancroftian filariasis (lymphatic filariasis)	Wuchereria bancrofti	Mosquitoes: Anopheles Aedes Culex and Mansonia Species
3.	Malayan filariasis (Lymphatic filariasis)	Brugia malayi and brugia timori	Mosquitoes: Anopheles Aedes Culex and Mansonia Species
4.	Loiasis	Loa loa	Red flies: Chrysops species
5.	Mansonelliasis	Mansonella species	Midges: Culicoides species
6.	Dirofilasiasis	Dirofilaria species	Mosquitoes: Culex species

SIGNS AND SYMPTOMS: Adult worms live in the lymph vessels and nodes, while the younger forms are found primarily in the blood. The symptoms are seen four to twelve months after infection, and usually begin with swelling and inflammation in the genitals or extremities. Other symptoms include fever, pain and swelling of lymph glands, headache and inflammation of lymph drainage areas, swelling of the scrotum, skin rashes and blindness. Progression of the diseases often causes enlargement of the legs resulting in a condition called elephantiasis or lymphatic filariasis. This enlargement occurs due to the presence of lymphodema or presence of fluid in the tissue spaces that may begin to accumulate in the first 24 hours. The skin becomes thick and rough and the increase in the size and eight of the affected parts lead to disability.[10-13]

DIAGNOSIS

PHYSICAL EXAMINATION

It may show characteristic painful/swollen lymph nodes (lymphadenitis), which is most sever at the affected node and decreases in intensity with distance from the node (retrograde). In later stages, involvement of the peritoneal lymphatics will also occur in a retrograde fashion. Abdominal palpation (examination by pressing on the abdomen) may reveal a swollen spleen or liver. In chronic cases, swelling of the scrotum and enlarged lymphatic vessels are characteristic physical symptoms. The infected area, commonly a limb or the skin becomes enormously enlarged and the skin becomes thick, coarse and cracked (fissured). Hard mass may accumulate in the breast, legs hands or testicles. A milky, white substance (chyle) may appear in the urine as a result of lymphatic vessels rupture into the urinary tract.[14]

TEST

The diagnosis of filariasis is confirmed by microscopic examinations of blood or lymph for the presence of microfilariae. Blood tests will show immature worms in the blood after six to twelve month of infection. It may take two to three years for worms to develop in the blood of indigenous persons. Worms may also be present in fluid drawn from swollen areas. Each species of filarial nematode will show characteristic structure and morphology under microscopic examination. Microscopic (histologic) examination of the skin in areas of mass accumulation will show hardening and loss of elasticity. Lymph nodes may become fibrotic and secondary bacterial infection may be detected. In blood studies (serology), chronic infections may show high filarial antibody titer and IgE level. Lung infection will show high eosiniphil counts (Eosinophilia). In occult disease, worms are not present in the blood. Adult worms may be detected in tissues, using Ultasonography, X-rays may shows scattered small nodular lesions on the lungs. There may be increased evidence of vascular damage on the chest films.[15]

NEW ADVANCES IN DIAGNOSIS OF LYMPHATIC FILARIASIS

The recent developments in the diagnosis of lymphatic filariasis are given below, which have heralded changes in the management strategies.

1. **MEMBRANE FILTRATION METHOD FOR MICROFILARIA DETECTION** venous blood drawn at night and filtered through millepore membrane filters, enables easy detection of microfilaria and to qualify the load of infection. They are seen early stages of the diseases before clinical manifestations develop. Once lymphodema develops microfilaria generally absent in the peripheral blood. The Quantitative blood count (QBC) methods also can be used to identify the microfilaria and to study their morphology in the blood drawn at night. Thought this can be performed quickly, it is no more sensitive than examination of the conventional blood smear.[16-19]

2. **ULTRASONOGRAPHY:** Recently ultrasonography using a 7.5 or 10 MHz probe has helped to locate and visualize the movements of living adult filarial worms of W. Bancrifti in the scrotal lymphatics as asymptomatic males with microfilaraemia. The constant thrashing movements of the adult worms in their ‘nests’ in the scrotal lymphatics is described as the “filarial dance sign”. The lymphatic vessels lodging the parasite are dilated and this condition in snot seen to revert to normal even after the worms are killed by administration of Diethylcarbamazine (DEC). Ultrasound has been used to study the

effect of drugs on the adult worms and to retrieve them surgically from the dilated scrotal lymphatics. Ultrasonography is not useful in patients with filarial lymphoedema because living adult worms are generally not present at this stage of the disease/ similarly ultrasonography has not helped in locating the adult worms of B. malayi in the scrotal lymphatic since they do not involve in the genitalia.[20-22]

3. **LYMPHOSCINTIGRAPHY:** The structure and function of the lymphatics of the involved limb can be assessed by lymphoscintigraphy. After infection radio-labeled albumin or dextran in the web space of the toe, the structural changes are imaged using a gamma camera. Lymphatic dilatation, dermal back flow and obstruction can be directly demonstrated in the oedematous limbs by this method. Lymphoscintigraphy has shown that even in the early, clinically asymptomatic stage of the disease, there are lymphatic abnormalities in the affected limbs of people harboring microfilaria.[23]

4. **The Og4C3 (ELISA):** Two monoclonal- based enzyme linked immunosorbent assays (ELISA) that detect circulating W. bancrofti antigens have been developed. The first assay, based on the monoclonal antibody AD 12, recognizes a 200kD antigen that is thought to be of adult worm origin. The second assay, which utilizes the monoclonal antibody Og4C3 is thought by some investigators to recognize only adult worm and the microfilariae the antigen may be shared by both the adult worm and the microfilariae. A major advantage of both these assays is that circulating filarial antigen remains diurnally constant; therefore, blood for diagnosis can be collected during the day.

The Og4C3 assay was the first to become commercially available (as Trop-Ag W. bancrofti, manufactured by JCU Tropical Biotechnology Pty LT. Townsville, Queensland Australia). In microfilaraemic persons its sensitivity approaches 100%, although it may be as 72% to 75% in persons with ultra low microfilarial densities. The assay also has a high specificity 98.6% to 100%.

The monoclonal antifilarial antibody AD12 has recently been incorporated into a commercially available rapid format card test by ICT Diagnostics (Balgowalh, New South Wales, Australia). The assay has a reported sensitivity of 96% to 100% and a specificity of 100%. Sensitivity appears to be lower in infected persons who are microfilaria negative or those with ultra low microfilarial densities.

Both antigen detection assays appears to be more sensitive than detection of micropilariae in 1 ml of filtered blood. Thus, they appear promising for diagnostic use. A positive test result should be interpreted as evidence for the presence of live adult W. bancrofti. Patterns of filarial antigen clearance after treatment with DEC or ivermectin have been confirmed drug efficacy against that living adult worms are no longer present. Clearance of adult worm antigen may take several months; histologic evidence reveals incomplete absorption of adult worms as long as four months after treatment. Therefore, antigen-detection assay may not be useful for short term post treatment follow-up.[24-27]

5. **IMMUNOCHROMATOGRAPHIC TEST (ICT):** Highly sensitive and specific filarial antigen detection assays, both as card test and in ELISA based format are now available for the diagnosis of *W. bancrofti* infection. The card test has the advantage that it can be performed on blood sample drawn by finger prick at any time of the day. This test is positive in early stages of the diseases when the adult worms are alive and becomes negative once they are dead. At present no such test is available for B. malayi filariasis, where the detection of IgG4 antibodies is helpful the day.[28]

6. **MOLECULAR BASE TEST: DNA probes using Polymerase Chain Reaction (PCR)** These tests are of high specificity and sensitivity, where are available to detect parasite DNA in humans as well as vectors in both bancroftian and brugian filariasis. Though this method is quick and easy to perform. The disadvantage is that it requires sophisticated equipment and is available only in very few centers.[29-31]

TREATMENT AND PREVENTION OF FILARIASIS (DAUL FEEL)

DEC (6mg/kg) is the drug registered for use in lymphatic filariasis. Efficacious treatment is the administration of high-dose DEC. Unfortunately, DEC administration in this fashion cause adverse effects, which remained a disincentive to its use in many locales. A low dosage of DEC can be administered to all residents of an endemic area except infants, pregnant women, elderly persons, and persons with debilitating disorders. Sometimes, low dose DEC is combined with albendazole. Ivermectin (400mcg/kg//d) is an equally potent microfilaricide, and the combination of DEC and Ivermectin provides significant synergism. Tetracycline antibodies kill Wolbachia endosymbionts and have a macrofilaricidal effect in lymphatic filariasis. Doxycycline at 100 mg/d for 6-8 weeks has demonstrated efficacy against lymphatic filariasis. For control, the World Health Organization has long recommended a single, yearly oral dose of ivermectin (400mcg/kg) with DEC (6mg/kg).

Additionally, patients should use limb elevation, special message technique and elastic stocking to protect the affected extremity. Patients with severely damaged extremities may benefit remarkably from surgical decompression of the lymphatic system through endovenous shunt surgery followed by excision of redundant tissue. Surgical correction or repeated drainage is the treatment for hydroceles. Surgical correction sometimes is used to correct chyluria. Interestingly, the diagnostic lymphangiography itself often appears to terminate the leak of chyluria into the urine, probably because of its sclerosing effects on the lymphatic vessels that have ruptured into the renal pelvis.[31-33]

UNANI TREATMENT

Coded Unani formulations

- DF1,DF4, DF6 DF4
- DF8 & DF19 DF15 DF16DF17 DF12
- UNIM-268, UNIM-269, UNIM-271, UNIM-273 & UNIM-272

Compound Unani drugs

1. **Fillia** in the of 2 table twice daily: Drug is manufactured by Dawakhan Tibbya College, AMU, Aligarh.
2. **Filarian** in the dose of in the of 2 table twice daily: Drug is manufactured by national Laboratories (P) Ltd, 205-A Okhla Industrial Area, New Delhi-25.

Table 3: SINGLE UNANI DRUGS USED IN FILARIASIS (*DAUL FEEL*).

S.No	Unani Medicine	English Name	Botanical Name
1.	Aftimoon vilayeti	Common Dodder	*Cuscuta chinensis* Lam
2.	Babool	Indian Gum Arabic Tree, Black Babool	*Acacia nilotica* (L) wild.ex Delili
3.	Badam	Almond	*Prunus amygdalus* Batasch.
4	Badiyan	Fennel	*Foeniculum vulgare* Mill.
5	Behidana	Quince Seeds	*Cydonia oblonga* Mill
6	Bisfaij	Common Polypody	*Polypodium vulgare* Linn.
7.	Biskhapra	Horse purslane, carpet weed	Trianthema portulacastrum Lnn
8.	Chiraita talkh	Chiretta	Swertia chirayita Roxb. Ex Fleming)
9.	Filfil siyah	Black Pepper, Peppercorns	*Piper nigrum*
10.	Gaozaban	Common borage	*Borago officinalis Linn*
11.	Gul-e-abbas	Four o'clock flower or marvel of Peru)	*Mirabilis Jalapa Lnn.*
12	Gul-e-surkh	Damasc Rose	*Rosa damascene* Mill
13.	Habbul neel	Ivy-leaved morning glory	*Ipomoea hederacea* Jacq.
14.	Hanzal (Indrayan)	Bitter apple	*Citrulus colocynthis* Schard.
15.	Izkhar	Iwarancusa grass	*Cymbopogon jawarancusa* Schult
16.	Jalapa	Turpeth Root, Indian Jalap	*Ipomoea turpethum* Linn Silva Manso
17.	Kachnal	Mountain ebony	*Bauhina racemosa* Vahl
18.	Karfs	Wild Celery	*Apium graveolens* Linn
19.	Karanjwa	Fever Nut	*Caesalpinia bonduc* (L) Roxb.

20.	Kasni	Chicory, Succory, Wild Endive	*Cichorium intybus* Linn
21.	Kataikhurd	Yellow Berried Nightshade	*Solanum zanthocarpum* Schrad
22.	Khare khasak	Small Caltrops	*Tribulus terrestris* Linn
23.	Khayar Shambar (Amaltas)	Indian Laburnum	*Cassia fistula* Linn.
24.	Khatmi	Marshmallow	*Althaea officinalis* Linn
25.	Mundi	East Indian Globe Thistle	*Spnaeranthus indicus* Linn
26.	Naeem	Margosa Tree	*Aadirachta idica* Linn. Juss
27.	Sana	Senna, Arabian senna	*Cassia angustifolia* Vahl.
28.	Sarphoka	Wild Indigo	*Tephrosia purpura* Linn.
29.	Turbud	Indian jalap,Turpeth	*Merremia turpethum* Linn
30.	Unnab	Jujube Fruit	*Zizyphus sativa* Gaertn.
31.	Ushba	Indian Sarsaparilla	*Hemidesmus indicus* (L) R.Br.
32.	Zaitoon	Olive	*Olea europaea* Linn

[34]

PREVENTION

Prevention includes giving medicine that kill the microscopic worms to the entire community in the areas where the infection prevalent. Avoiding mosquito bites is another form of prevention. These mosquitoes usually bite between the hours of dusk and dawn. One can follow these steps, if living in an infected area.

- Sleep under a mosquito net
- Use mosquito repellents in the exposed skin

Take a yearly dose of medicine that kills the worms in the blood.[35-36]

RISK OF FILARIASIS

Over 120 million have already been affected by it, over 40 million of them are seriously incapacitated and disfigured by the disease. One-third of the people infected with the disease live in India, one third are in Africa and most of the remainder are South Asia, the Pacific and America. In communities where the condition is endemic, 10-50% of men and up to 10% of women can be affected. Through the infection is generally acquired early in childhood, the disease may take years to manifest itself.[37-38]

CONCLUSION

Filariasis is an infection caused by a parasite worm and is transmitted by insect bite. It is more prevalent in the tropical and subtropical areas of Africa and Asia Central and South America. In India, it is common Uttar Pradesh Bihar Orissa Tamil Nadu. Lymphatic filariasis affects more than 120 million people worldwide, over 40 million of these are seriously incapacitated and disfigured by the disease. This disease spreads from person to person by mosquito bites. When a mosquito bites an infected person, microscopic worms circulating in this blood enter and infect the mosquito. These worms then pass to the other person when this

infected mosquito bite him. The worms transferred from the mosquito, move through the skin, and travel to lymph vessels, where they grow into adults, and adult worm lives fro about seven years. The adult worms mate and release millions of microscopic worms in to the blood. There are eight different types of this worm, out of which three are responsible for causing the diseases. 1. Wucheria bancrifti and Brugia malayi cause lymphatic filariasis and Onchocera volvulus cause Onchocerciasis (River blindness). The medications started at low doses to prevent reactions caused by large numbers of dying parasites. These medications can cause severe side effects in up-to 70% of patients. These side effects can be controlled with anti-histamines and anti- inflammatory drugs (corticosteroids). Rarely, treatment with Diethyl carbamazine may leads to a fatal inflammation of the brain (encephalitis). The proper diagnosis is done by new advance technology to filariasis after that the treatment may given to patient and post treatment evidence also recorded. The present research in filariasis is fully deepened on old methods of diagnosis and evaluated by one parameter e.g. water displacement method. In this article we emphasize the research work should be done with new advance technology for diagnosis and scientifically prove the efficacy of Unani drugs.

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