

Role of Herbal Medicine Used To Treat HIV and AIDS

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ABSTRACT:

Herbal drug use is getting veritably popular in numerous countries especially in the western world, where public health safety has come a concern, especially its attendant use with orthodox drug. The ruinous impact of HIV/ AIDS epidemic coupled with the severe deficit of health labor force has impelled cases to develop managing mechanisms by espousing indispensable sources of primary health care, one of which has been the use of herbal curatives. An integration of herbal drug into the current medical class will enable unborn croakers. To communicate more with their cases on this evolving healthcare system. This review briefly examines the part of herbal drug in HIV/ AIDS treatment and operation. It's hoped that this review will give important and applicable information that will help policy makers to put in place control Measures against the abuse of herbal remedy.

Keywords: AIDS, HIV, herbal medicine, traditional Chinese medicine

I. INTRODUCTION

Human immunodeficiency virus infection / acquired Immunodeficiency syndrome (HIV-AIDS) is a viral Infection that effects the human immune system. The HIV virus comprises of two types, HIV-1 and HIV-2, and is a retrovirus that infects and destroys T-cells, Macrophages and dendritic cells. HIV-2 is predominant In West Africa, whereas the more virulent HIV-1 is the Cause of the majority of infections globally. Symptomatically, within two weeks of initial Infection, infected individuals may experience an Influenzalike illness, with associated swelling of lymph Nodes and skin rash, which then subsides with no further Symptoms. As the disease progresses the individual's Immune system becomes suppressed via the reduction Of cluster differentiation 4 protein (CD4), which is a Glycoprotein found on the surface of immune cells, such As T-helper cells (herein abbreviated CD4 cells), which Has an important role in the adaptive immune system. Clinically, HIV infected patients

display CD4 cell counts <200/mL blood. The patient's prognosis includes a higher relative Risk of infections, including opportunistic infections and tumour development. HIV transmission is spread primarily via unprotected sexual intercourse,

Blood transfusions, hypodermic needles, pregnancy, Breastfeeding and body fluid exposure to sensitive Tissues such as the eyes and tear ducts. At present there is No HIV vaccine available, with anti-retroviral treatment only slowing the progression of the disease. Immune System support appears to be another therapeutic Opportunity, with certain herbal medicines appearing Useful in the management of the immune system and Thus HIV management. The use of herbal medicine is increasingly becoming more popular in many countries [1]. This practice has continued to be a main source of Health care in the rural communities especially in developing countries, since modern medicine has not been able to reach the majority of the populace. Also, herbal medicines are still being commonly sold by practitioner and their agents without any restriction with most of the health care providers receiving little or no formal training in this Area. This lack of proper training may be associated with the inability of herbal practitioners or their agents to answer questions patients have about its efficacy either as a supplement to orthodox medicine Or as a therapy to treat or prevent disease. Their inability to answer Questions may partly be linked to the fact herbal medicine involve a sophisticated theory or system, with the knowledge that is often passed On, verbally or otherwise, from generation to generation [2,3,4]. Notwithstanding, there have been a remarkable increase in the popularity Of herbal preparations especially in developed countries, which has Stimulated considerable public health concern among physicians who Are sometimes uncertain about the safety of herbs especially when Used concomitantly with regular orthodox medications^[5].

HIV/AIDS pandemic is currently the most socio-economic challenge that is facing the world

at large as it affects mostly the young and economically productive population [6]. A study has shown that majority Of people living with HIV/AIDS are susceptible to fungal and bacterial opportunistic infections that result from immunosuppression and Treatment of such infections is therefore one of the areas that traditional health services for the control of the disease is prevalent[6]. The World Health Organization (WHO) estimates that 4 billion people (80% Of the World's population) use herbal medicines for some aspect of primary healthcare [7]. Treatment of diseases using traditional remedies is an age old art which has been confined into the backstage due to Access to western biomedicine, adequate education, employment opportunities and economic growth [8].

Herbal medicines and faith healing is widely practiced For HIV/AIDS patients in Ethiopia.²⁰ However, the extent And factors associated with herbal medicine use among HIV/AIDS patients on ART are not well documented although two studies were conducted in Gondar teaching Hospital, Northwest Ethiopia. Endale et al reported that 43.7% of the patients use herbal medicines while on ART.²¹ Another study in the same facility by Haile et al revealed that 70.8% of the HIV patients on ART have used Herbal medicine. The most common herbal preparations Used by people living with HIV/AIDS were Ginger (*Zingiberofficinale*) (47%), Garlic (*Allium sativum* L.) (40.8%), and Moringa (*Moringastenopetala*) (31.4%).

With little evidence supporting the safety and efficacy Of herbal use for HIV/AIDS management, the potential of Herbal medicines to interfere with the effectiveness of ART is a pressing concern.²² Indeed, the use of certain Types of herbs may compromise the efficacy of ART as A result of an unanticipated drug interaction or side effects From herbs.²³ The potential for adverse outcomes may be Amplified when HIV-positive patients do not disclose their Herbal medicine use to their HIV care providers or when Patients' preferences for herbs interfere with the uptake of Conventional HIV treatments. Hence, research determining The extent and the determinant factors for using herbal Medicine is paramount important to recognize at the implication of herbal use in HIV/AIDS care, and anticipate Patients with higher potential to use herbal medicine concomitantly with ART and provide counseling accordingly. Therefore, this study aims to assess the prevalence of Herbal medicine use, reasons for use and

associated factors Among PLWH on ART attending of TikurAnbessa Specialized Hospital, Ethiopia.

Etiology

The cause of this infectious disease is the human immunodeficiency virus (HIV), which can be classified into HIV-1 and HIV-2. HIV-1 is more globally expanded and virulent. It originated in Central Africa. HIV-2 is much less virulent and comes from West Africa. Both viruses are related antigenically to immunodeficiency viruses found primarily in primates

Pathophysiology

HIV attaches to the CD4 molecule and CCR5 (a chemokine co-receptor); the virus' surface fuses with the cellular membrane, which allows it entry into a T-helper lymphocyte. After integration in the host genome, the HIV provirus forms and then follows transcription and viral mRNA production. HIV structural proteins are made and assembled in the host cell. Viral budding from host cells can release millions of HIV particles that can go to infect other cells

Treatment / Management

Antiretrovirals are drugs used to treat HIV infections/AIDS, and they are used in various combinations, commonly referred to as highly active retroviral therapy (HAART). The antiretrovirals agent include nucleoside/nucleotide reverse transcriptase inhibitors (NRTIs), NRTI fixed-dose combinations, integrase inhibitors, non-nucleoside reverse transcriptase inhibitors (NNRTIs), protease inhibitors, and CCR5 inhibitors. All patients with HIV, regardless of what level of CD4, should be started on HAART, which is a treatment for life. This therapy has been shown to reduce morbidity and mortality and lower the risk of transmitting the infection to others, as long as they have a low or undetectable viral load.

Single Tablet Regimens

- Efavirenz/emtricitabine/tenofovir disoproxil is a tablet comprising 600-mg efavirenz, 200-mg emtricitabine, and 245-mg tenofovir disoproxil. It should be taken as a single pill once a day. It can cause sleep disturbances, tiredness, dizziness, rash, nausea, vomiting, diarrhea, abnormal dreams, impaired concentration, headache, anxiety, depression, raised creatine kinase levels, skin darkening, low blood phosphate levels, weakness, stomach pains, bloating, and flatulence.

- Rilpivirine/emtricitabine/tenofovir disoproxil is a tablet comprising 25-mg rilpivirine, 200-mg emtricitabine, and 245-mg tenofovir disoproxil. It should be taken as a single pill once a day. Side-effects include nausea, vomiting, diarrhea, dizziness, insomnia, headache, fatigue, weakness, rash, stomach pains, flatulence, changes in kidney function, raised creatine kinase levels, low blood phosphate levels, skin darkening, mood changes, and depression.
 - Rilpivirine/tenofovirafenamide/emtricitabine is a tablet comprising 25-mg rilpivirine, 25-mg tenofovirafenamide, and 200-mg emtricitabine. It should be taken as a single pill once a day. It can cause reduced white, red blood cell and platelet count, raised lipids, tiredness, headache, dizziness, insomnia, depression, nausea, abdominal pain, vomiting, flatulence, liver enzymes, dry mouth, raised amylase levels, and bilirubin.
 - Elvitegravir /cobicistat/emtricitabine/tenofovirafenamide is a tablet containing 150-mg elvitegravir,
 - 150-mg cobicistat, 200-mg emtricitabine, and 10-mg tenofovirafenamide. It should be taken as a single tablet once a day. Side-effects of this regimen include nausea, abnormal dreams, diarrhea, vomiting, stomach pain, headache, dizziness, rash, and tiredness.
 - Elvitegravir/cobicistat/emtricitabine/tenofovir disoproxil is a drug comprising 150-mg elvitegravir, 150mg cobicistat, 200-mg emtricitabine, 245-mg tenofovir disoproxil. It should be taken as a single tablet once a day. It can cause nausea, headache, fatigue, diarrhea, dreams, dizziness, insomnia, rash, flatulence, and sleepiness.
 - Dolutegravir/abacavir/lamivudine is an antiretroviral comprising 50-mg dolutegravir, 600-mg abacavir, and 300-mg lamivudine. It should be taken as a single tablet once a day. Side-effects include insomnia, headache, diarrhea, stomach pain, drowsiness, dizziness, hair loss, nausea, fatigue, rash, itching, vomiting, depression, flatulence, muscle pain and discomfort, an irritated or a runny nose, indigestion, and loss of appetite.
- Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTIs)
- Abacavir (300 mg), a tablet, should be taken twice a day or 600 mg once a day. Its side-effects include nausea, fever, headache, vomiting, diarrhea, abdominal pain, tiredness, and loss of appetite.
 - Emtricitabine (200 mg), a capsule, should be taken once a day. It can cause nausea, raised creatine kinase levels, diarrhea, headache, and skin darkening.
 - Lamivudine 150 and 300 mg, a tablet of 150 mg should be taken twice a day or 300 mg once a day. The regimen can cause nausea, vomiting, diarrhea, abdominal pain, hair loss, fever, insomnia (difficulty sleeping), rash, tiredness, and joint pain.
 - Zidovudine comes in 100- and 250-mg capsules. A capsule (250 mg) should be taken twice a day. Common side-effects are nausea, fatigue, headache, weakness, muscle pain, vomiting, loss of appetite, and fever.
 - Tenofovir disoproxil (245 mg) should be taken once a day. It can cause nausea, vomiting, diarrhea, low blood phosphate levels, flatulence, dizziness, weakness, rash, headache, stomach pains, and fatigue.
- NRTI Fixed-Dose Combinations
- Abacavir/lamivudine: Tablet comprising 600-mg abacavir and 300mg lamivudine. It should be taken one tablet once a day. Its commonest side-effects include nausea, vomiting, diarrhea, loss of appetite, hair loss, cough, fever, headache, stomach pains, tiredness, runny nose, insomnia (difficulty sleeping), muscle pain, rash, joint pain, and hypersensitivity reaction.
 - Abacavir/lamivudine/zidovudine: Tablet comprising 300-mg abacavir, 150-mg lamivudine, and 300-mg zidovudine. One tablet twice a day should be taken. It can cause nausea, vomiting, diarrhea, fever, loss of appetite, hair loss, cough, headache, stomach pains, tiredness, runny nose, insomnia (difficulty sleeping), joint pain, rash, dizziness, muscle pain, and hypersensitivity reaction.
 - Emtricitabine/tenofovir disoproxil: Tablet comprising 200-mg emtricitabine and 245-mg tenofovir disoproxil. One tablet, once a day, should be taken. It can cause nausea, diarrhea, vomiting, flatulence, dizziness, headache, raised creatine kinase levels, rashes, low blood phosphate levels, weakness, rash, skin darkening, stomach pains, and difficulty sleeping.
 - Lamivudine/zidovudine: Tablet comprising 150-mg lamivudine and 300-mg zidovudine. It should be taken one tablet twice a day. Its significant side-effects include nausea,

vomiting, diarrhea, headache, insomnia (difficulty sleeping), cough, runny nose, stomach pains, hair loss, fever, rash, tiredness, joint pain, dizziness, muscle pain, and loss of appetite.

Integrase Inhibitors

- Dolutegravir 50-mg tablet: Taken 50 mg once a day or 50 mg twice a day if taken with efavirenz, nevirapine, or tipranavir. It can cause nausea, diarrhea, headache, rash, itching, vomiting, dizziness, abnormal dreams, fatigue, flatulence, stomach pain or discomfort, insomnia, an increase in liver and muscle enzymes.
- Raltegravir 400- mg tablet: It should be taken 400 mg twice a day. Its side-effects include a headache, insomnia and rarely severe rash, hypersensitivity reaction, and extreme thirst

Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

- Etravirine 100- and 200-mg tablets: It should be taken as a 200-mg tablet twice daily. The side-effects are rash and peripheral neuropathy. Nevirapine 200-mg tablet is taken once a day for two weeks, then 200mg twice a day. It can cause liver toxicity, rash, nausea, headache, allergic reaction, fatigue, stomach pain, and diarrhea.
- Rilpivirine 25-mg tablet is taken once a day. Its significant side-effects are insomnia, headache, rash, stomach pains, raised liver enzymes, depression, dizziness, and vomiting. CCR5 Inhibitor
- Maraviroc 150- and 300-mg tablets: This tablet should be taken at a dose of 300 mg twice a day. It can cause diarrhea, fatigue, and headache, and rarely liver disease.

Protease Inhibitors

- Atazanavir 150-, 200- and 300-mg capsules: The 300-mg formula also comes with 100-mg ritonavir and should be taken once a day. It can cause nausea, diarrhea, rash, stomachache, headache, insomnia, hyperbilirubinemia, lipodystrophy, vomiting, liver toxicity, and diabetes.
- Darunavir 600- and 800-mg tablet: It should be taken as an 800-mg tablet with 100-mg ritonavir once a day. Its common side-effects include diarrhea, nausea, rash, stomach pain, headache, lipodystrophy, diabetes, and liver toxicity.

- Lopinavir /ritonavir tablet is comprised of 20-mg lopinavir and 50-mg ritonavir that is taken as 2 tablets twice a day or 4 pills once a day. It may cause lipodystrophy, raised liver enzymes, nausea, abdominal pain, weakness, vomiting, heartburn, headache, diarrhea, increased lipids, liver toxicity, and diabetes.
- Atazanavir /cobicistat tablet is comprised of 300-mg atazanavir and 150-mg cobicistat. It should be taken once a day. It can cause jaundice, hyperglycemia, dry mouth, headache, dizziness, vomiting, diarrhea, sleep problems, hyperbilirubinemia, rash, fatigue, and lipodystrophy.

Classification of Antiretroviral drugs:

1) Nucleoside reverse transcriptase inhibitors

Example: Abacavir ,Didanosine , Emtricitabine, Lamivudine ,Stavudine ,Zidovudine

2) Nucleotide reverse transcriptase inhibitors

Example: Tenofovir

2) Non-nucleoside reverse transcriptase inhibitors

Example: Efavirenz ,Nevirapine

3) Protease inhibitors

Example: Amprenavir ,Atazanavir, Fosamprenavir , Indinavir , Lopinavir with ritonavir ,Nelfinavir,Ritonavir ,Saquinavir

4) Fusion inhibitors

Example: Enfuvirtide

Mechanism of Action of Antiretroviral drugs:

Different types of ARVs act in different ways to prevent the replication of HIV In the human body. These different pathways are briefly described below.

1)Nucleoside reverse transcriptase inhibitors (NsRTIs) and Nucleotide reverse Transcriptase inhibitors (NtRTIs):

NtRTIs and NsRTIs act by incorporation into the DNA of the virus (competing with natural nucleotides/nucleosides), thereby stopping the building process Of transcription from RNA to DNA. The resulting DNA is incomplete and cannot create a new virus.

2)Non-nucleoside reverse transcriptase inhibitors (NNRTIs)

NNRTIs act by stopping HIV production by binding directly onto reverse Transcriptase (noncompetitively) and preventing the conversion of RNA to DNA.

3)Protease inhibitors (PIs)

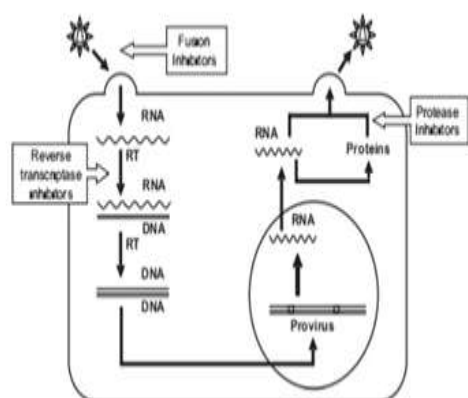
They act by binding to the viral protease, thereby preventing the correct cleavage Of viral proteins.

Thus, they prevent HIV from being successfully assembled and released from the infected cells.

5) Fusion inhibitors

Fusion inhibitors (peptides) act by binding to a region of the gp41 transmembrane Glycoprotein of HIV and prevent virus–cell fusion.

Figure 1. Mode of action of different types of ARVs



Regional use of herbal medicine

Herbal medicine in the Caribbean

Afro-Caribbean pharmacopoeia is the body of knowledge and practices around medicinal plants with its origins in the cultures of African Slaves brought to the Caribbean [9]. Herbal baths are common in Haitian culture for both spiritual and medicinal practices and represent The second most important category of administration after ingestion In the region [10]. There is significant use of herbal remedies in the Caribbean and recent studies in Trinidad show relatively high prevalence Of use for symptomatic relief in asthma and therapeutic management In diabetes mellitus [11-12]. No herbal treatment of HIV/AIDS was seen In all literature review done by the authors.

Herbal use in North America

The increasingly diverse US immigrant populations have led to the Growing use of medicinal herbs. A survey conducted by the National Center for Complementary and Alternative Medicine in 2004 revealed That use of herbal therapy or of other natural products was most common of the

Complementary and alternatives medicines and the commonest reason for use of herbal medicines by Americans was that they believed they would improve health when used in

combination with Conventional medical treatments [13].

Herbal use in Africa

Herbs have a long history in African traditional medicine, however There has been increasing attention and interest in its use in recent Times [3]. Traditional herbal medicine has continued to be a main

Source of health care in the rural communities and heavy reliance on it by the majority of the subSahara Africa population has led to the generally accepted conclusion that it is most preferred form of treatment of HIV-related symptoms [14].

Herbal Use in Asia

Medicinal herbs are a major component of Traditional Chinese Medicine (TCM). It is estimated that over 600 different herbs have been used to treat various human diseases including those caused by viral Infection, accounting for approximately one-fifth of the entire Chinese Pharmaceutical market and are regarded as the state cultural treasure By the Chinese government [15]. Studies on the anti-HIV activities and Mechanisms of TCMs are very limited and are expected to accelerate. Herbs native to Japan were classified in the first pharmacopoeia of Japanese traditional medicine in the ninth century [16]. Ayurveda is A herbal medical system primarily practiced in India. It includes diet and herbal remedies, while emphasizing the body, mind and spirit, in Disease prevention and treatment [17].

Herbal use in Europe

Complementary or unconventional treatments are used by many doctors and other therapists throughout Europe. The major forms are acupuncture, homoeopathy, manual therapy or manipulation, and phytotherapy or herbal medicine. The relative popularity of therapies differs between countries, but public demand is strong and growing. Regulation of practitioners varies widely: in most countries only registered Health professionals may practice, but in the United Kingdom practice is virtually unregulated. Germany and some Scandinavian countries have intermediate systems. Legal reforms are in progress in the Netherlands and the United Kingdom. European institutions are starting to Influence the development of complementary medicine [18].In Germany, herbal medications are dispensed by pharmacists, subjected to same criteria for efficacy,

and safety and quality as are other Drug products. Despite the progress in orthodox medicine, interest in alternative medicine, including herbal medicine is the increase. A Great variety of plants are used for medicinal treatments, either the Dried plant or a specific part of it (root, leaves, fruit, flowers, seeds), is Formulated into suitable preparations-compressed as tablets or made Into pills, used to make infusions (teas), extracts, tinctures or mixed With excipients to make lotions, ointments, creams [1920].

Herbal medicine in the treatment Of HIV/AIDS

Only a few clinical trials are available on the use of herbal medicine in HIV-AIDS. They are often administered due to their low cost wide availability in Third world and developing nations where antiretroviral Drugs are not easily accessed. One issue is the misguided Healthcare provided by uneducated and unqualified Herbalists' misuse of herbal therapy in the treatment of HIV-AIDS in the third world and developing nations, 8Although this may represent traditional use of the herbal Medicines for infection and inflammatory conditions.

In the developed world CAM treatment appears to be widely used in conjunction with HIV conventional Treatment such as anti-retroviral drugs. Herbal medicines are used in combination with anti-retroviral drugs to reduce adverse effects of nausea and depression and for immune support/modulation. In the Third World And developing nations, due mainly to the cost of antiretroviral drugs, herbal medicines appear to be more Widely used, especially in management of associated Conditions such as immune suppression and opportunisticInfections. A study in Mexico revealed that of 293 HIV Patients, 73.4% used CAM of which 29.7% were herbal Products. The correlation of the use of CAM was highest In lower income earners due to the price of anti-retroviral Treatment.⁹ In Tanzania, due to cost restrictions, HIV Sufferers resorted to the use of an array of 75 herbal Medicine species, mostly leaf extracts and consumed as Decoctions for the treatment of associated infections such As tuberculosis and oral candidiasis.¹⁰ In Uganda, herbal Medicine treatment has been observed as a beneficial Treatment option for herpes zoster virus (i.e. reduced pain Severity) in HIV patients.¹¹

Survey of herbal medicine used in Treatment of HIV-AIDS in Thailand

A study from Thailand indicated that 31% of the Population reported using herbal medicine. With regard To government support for modern treatment, the Study showed that people living with HIV tended to seek assistance from health care services for obtaining Treatment. However, females living in up-country Areas received less modern treatment but found herbal Remedies more accessible for treatment. Respondents From provincial towns were found to use herbal remedies More often than those from Bangkok or highly urbanized Areas, and the most commonly used herbal remedy (by 21% of respondents) was bitter cucumber (*MomordicaCharantia*).¹²

Evaluation of herbal medicines used for Treating HIV-AIDS in South Africa

In a descriptive, prospective, follow-up study in South Africa, 33 HIV-positive volunteers (7 men and 26 women Between 22 and 43 years of age) were evaluated regarding the effectiveness of commonly used traditional herbal Medicines in the management of HIV-AIDS. The study evaluated the treatment efficacy of using herbal medicines by a number of qualitative parameters. The study was conducted over a period of one year. Participants showed significant health improvement: 80% of the patients displayed a better physical appearance, 65% had increased Appetite, 70% had disappearance of skin marks/ lesions, 100% had disappearance of urogenital lesions, and 80% Of participants had gained body weight, although body Composition was not specified. There was a significant Decrease in viral loads with a corresponding significant Increase by 2.5 fold in CD4 T-cell counts. Over 60% of Patients resumed workplace duties. The study strongly suggested the effectiveness of these traditional South African herbal medicines as supplementary or alternative Medicine in HIV-AIDS treatment, and the improvement In viral load suggested they had an anti-viral action. The Authors suggested the anti-viral activity may be due to The phytochemical composition of *Calendula officinalis* Or *Agastache rugosa*,¹³ which are used traditionally for Their anti-spasmodic and anti-bacterial actions.

Modulation of the immune system with Astragalus

Astragaloside II, a key phytochemical present in *Astragalus* spp., at a concentration of 100nmol/L, has Been shown to initiate T-cell

activation in primary murine Cell culture (in vitro study). The specific mechanism is Through the regulation of CD4 cells via 5 protein tyrosine Phosphatase activity (regulates phosphorylation state of Various signalling molecules), and may be the specific Mechanism by which astragalus modulates the immune System during disease,14 including HIV-AIDS. Astragalus (*Astragalus* spp.) was traditionally used as a tonic for Diabetes and as an adaptogen for 'healing' in Chinese Medicine.

Assessment of Immunoxel in treatment of TB among HIV-AIDS patients

The herbal medicine (Immunoxel) was administered With anti-TB therapy (ATT) among HIV-AIDS patients Suffering from tuberculosis. Forty patients were divided Into two arms of the study; arm A was treated with ATT And arm B with Immunoxel + ATT. Immunoxel comprises Of 27 immunological modulating herbal species. These Include; aloe (*Aloe arborescens*), centaury (*ErythraeaCentaurium*), parsley root (*Petroselinumcrispum*), Rosehip (*Rosa laevigata*), highbush cranberry fruits (*Viburnum opulus*), hypericum (*Hypericumperforatum*), Chinese agrimony (*Agrimoniapilosa*), sea buckthorn Berries (*Hippophaerhamnoides*), sage (*Salvia officinalis*), Birch leaves (*Betula* sp.), marigold flower (*Calendula Officinalis*), plantain (*Plantago major*), Siberian ginseng (*Eleutherococcusenticosus*),

common wormwood (*Artemisia absinthium*), linden (*Tiliacordata*), juniper Berries (*Juniperuscommunis*), rose root (*Rhodiolarosea*), Ground ivy (*Glechomahederacea*), oregano (*OriganumVulgare*), nettle leaf (*Urticadioica*), licorice (*Glycyrrhiza* Sp.), coneflower (*Echinacea purpurea*), wild thyme (*Thymus serpyllum*), equisetum (*Equisetum arvense*), wild Strawberry (*Fragariavesca*), chaga mushroom (*InonotusObliquus*) and green tea (*Thea sinensis*). It was observed That addition of Immunoxel reduced opportunistic Infections as well as improved clinical efficacy of ATT.17Given the wide array of herbal species it is unspecified Which phytochemicals are present and thus possibly Active to stimulate the immune system either in isolation Or in combination with other phytochemicals.

Long term treatment of paediatric AIDS

With herbal remedies in RomaniaIn Romania, 10 children living with AIDS when Treated with natural herbal remedies (Chan Bai San) showed improvement in CD4 count, decrease in mortality Rate and good maintenance of quality of life. These health Benefits were shown for those who kept taking the herbal Medicines for 3 years, without any side-effect of the Herbal medicine usage.

Table 1: Commonly used herbs in HIV-AIDS treatment

Table 1: Commonly used herbs in HIV-AIDS treatment

<p>Skin immunity</p> <ul style="list-style-type: none"> • Aloe vera (<i>Aloe vera</i>) <p>Adaptogen</p> <ul style="list-style-type: none"> • Ginseng (<i>Panax</i> spp.) • Withania (<i>Withania somnifera</i>) <p>Anti-bacterial</p> <ul style="list-style-type: none"> • Propolis* <p>Anti-inflammatory</p> <ul style="list-style-type: none"> • Atractylodes (<i>Atractylodes macrocephala</i>) • Olive tree (<i>Olea europaea</i>) • Tea tree (<i>Melaleuca alternifolia</i>) • Turmeric (<i>Curcuma longa</i>) <p>Anti-viral activity</p> <ul style="list-style-type: none"> • Golden Seal (<i>Hydrastis canadensis</i>) • Biscuit root (<i>Lomatium</i> spp.) • Neem tree (<i>Azadirachta indica</i>) • St. John's wort (<i>Hypericum perforatum</i>) <p>Anti-carcinogen</p> <ul style="list-style-type: none"> • Dyer's woad (<i>Isatis tinctoria</i>) 	<p>Circulatory stimulant</p> <ul style="list-style-type: none"> • Ginger (<i>Zingiber officinale</i>) • Ginkgo (<i>Ginkgo biloba</i>) <p>Depurative</p> <ul style="list-style-type: none"> • Garlic (<i>Allium sativum</i>) • Grapefruit seed (<i>Citrus x paradisi</i>) <p>Diaphoretic</p> <ul style="list-style-type: none"> • Boxwood (<i>Buxus sempervirens</i>) <p>Digestive carminative</p> <ul style="list-style-type: none"> • Peppermint (<i>Mentha x piperita</i>) <p>Expectorant</p> <ul style="list-style-type: none"> • Hyssop (<i>Hyssopus officinalis</i>) <p>Hepatoprotective</p> <ul style="list-style-type: none"> • Greater celandine (<i>Chelidonium majus</i>) • Licuorice (<i>Glycyrrhiza glabra</i>)* • Milk thistle (<i>Silybum marianum</i>)
<p>* Also denotes anti-viral activity. Some indications shown above differ from TCM theory. Adapted from (Lyons et al. 2005).</p>	

Herb	Benefits found by some people living with HIV/AIDS
Aloe	Helps to relieve constipation Use as extract; boil and drink the Concentrated water. To be used in limited amounts; stop immediately if it causes cramps or diarrhoea
Basil	Helps to relieve nausea and aid digestion; has an Add to food to treat nausea and digestive antiseptic function for mouth sores problems. Use as gargle for mouth sores
Calendula	Flower heads have antiseptic, anti-inflammatory and Use as a compress to treat infected healing function. Helps with infections of the upper wounds. Prepare as tea to help digestion digestive tract
Cardamom	Helps with digestive problems, pain, diarrhoea, Add to food during cooking or prepare as nausea, vomiting and loss of appetite tea
Cayenne	Stimulates appetite, helps fight infection, and heals ulcers Add a pinch to cooked or raw foods. For and intestinal inflammation an energizing drink add to fruit juice or water
Camomile	Helps digestion and provides relief for nausea Prepare tea from the leaves and flowers and drink several cups throughout the day
Cinnamon	Good for colds and for weakness after colds or flu. Either add to meals or in tea, particularly Also used when feeling cold, for diarrhoea and ginger cinnamon tea for chesty colds or nausea. Stimulates appetite. Gently stimulates tuberculosis (see recipe in Annex 1) digestive juices, encouraging bowel movements
Cloves	Stimulate appetite, help weak digestion, diarrhoea, Use in soups, stews, warmed fruit juice nausea and vomiting and tea
Coriander	Helps to increase appetite and reduce flatulence. Add herb to meals Controls bacteria and fungi
Eucalyptus	Has an antibacterial function, particularly for lungs Prepare tea from the leaves or extract and during bronchitis. Eucalyptus oil from leaves (see recipe in Annex 1) increases the blood flow and reduces the symptoms of inflammation
Fennel	Helps to increase appetite, combat flatulence and Add as spice to foods or prepare tea from expel gas the seeds. Use in limited amounts
Garlic	Has antibacterial, antiviral and antifungal function, Prepare tea or energy drink (see recipe in particularly in the gut, intestines, lungs and vagina. Annex 1), or use in food Helps digestion and feeling of weakness. Also good for thrush, throat infections, herpes and diarrhoea
Ginger	Improves digestion, energizes, relieves diarrhoea and Use either as a spice in meals or prepare stimulates appetite. Used for treating common colds, a ginger tea (see recipe in Annex 1) flu and nausea
Lemon	Is antibacterial and helps digestion Add lemon juice to food or drinks
Mint	Has an anti-inflammatory effect and helps digestion Use as tea or gargle for mouth sores. Chew mint leaves to aid digestion
Neem	Brings down fever Cut a fresh twig, remove the leaves and boil the bark in water; drink as tea. The bark can also be chewed Parsley Reduces intestinal colic. Stimulates stomach Add raw or cooked to food secretions and activities and produces a feeling of

	hunger. The seed is used to remove excess water from the body
Peppermint	May help nausea.
Turmeric/	Digestive aid, antiseptic and antioxidant Use powdered in rice, cereals, etc

Formulation used in the HIV and AIDS:

Triphala churna

Introduction

Three medicinal herbs make up Triphala (in Sanskrit, “tri” means “three” and “phala” means “fruits”). It is an antioxidant-rich herbal preparation described as a Rasayana (rejuvenator) medicine by Ayurvedic practitioners. Combining the three fruits is said to be responsible for triphala’s numerous health benefits. Triphala is made from dried fruits of three different plants: Terminaliachebula (black myrobalakTerminaliabellerica (bastard myrobalan), and Phyllanthusemblica (emblicmyrobalan or Indian gooseberry). The spring-harvested fruits of Terminaliachebula are high in tannins such as gallic acid, ellagic acid, chebulic acid, chebulinic acid, chebulagic acid, neochebulinic acid, corilagin, terchebin, punicalagin, and terfavin, flavonoids (rutins, luteolin and quercetin), starches, amino acids (glutamic acid, aspartic acid, lysine, arginine and proline), Î²-sitosterol, succinic acid, fructose and fatty acids.

Chemical Composition

The fruits of Terminaliabellerica consist of proteins and oils that include omega-3 and omega-6 fatty acids (linoleic acid). Because of its high fatty acid content, this plant can impact cholesterol levels, increasing high-density lipoprotein levels

(good cholesterol) while decreasing low-density lipoprotein levels (bad cholesterol), making it effective in treating coronary artery disease. Phyllanthusemblica (amla) fruits are high in ascorbic acid i.e. vitamin C.

The high density of tannins may contribute to the overall bitterness of amla. These fruits also includeincludepunicaefolin and phyllanemblinin A, phyllembelin, and other polyphenols such as gallic acid, ellagic acid, flavonoids, kaempferol.

INGREDIENTS:

Triphala is made from three fruits of the myrobalans family

- 1)Amlaki (Phyllanthusemblicaor Amla)
- 2)Haritaki (Terminaliachebula or Harda)
- 3)Vibhitaki (Terminaliabellerica or Baheda)

Typically, those available most easily is the Triphala Churna made with the above three fruits in a ratio of 1:1:1.

Uses of Triphala

It is described as a tridoshicRasayana in Ayurveda, capable of balancing and rejuvenating the three doshas that regulate human life: Vata, pitta, and Kapha. It is widely used in several disease conditions owing to its following properties:



- Laxative
- Anti-inflammatory
- Antiviral
- Blood purifying
- Analgesic
- Anti-arthritis
- Hypoglycemic
- Anti-ageing
- Antibacterial

Triphala is used to treat fatigue, oxidative stress, and infectious disorders like tuberculosis, pneumonia, AIDS, and periodontal disease, among

others. For headaches, dyspepsia, ascites, and leukorrhea.

Benefits of Triphala

1. Benefits of Triphala for Infections:

- Triphala and its components have demonstrated potent antimicrobial properties against a variety of microorganisms.
- Triphala churna has proven action against the human immunodeficiency virus (HIV).
- Triphala churna and triphalamashi have shown antibacterial properties against a variety of bacteria like *E. coli* and *S. aureus*.

2. Benefits of Triphala for Dental Care:

- Triphala reduced levels of chemicals which are implicated in the destruction of tissue during periodontitis.
- Triphala mouthwash was tested clinically and found to be as effective as chlorhexidine in lowering plaque scores and inhibiting *Lactobacillus* bacteria microbial levels

3. Benefits of Triphala for Stress:

Triphala supplementation has been shown to alleviate stress.

- Triphala treatment can prevent cold stress-induced behavioural and biochemical abnormalities by increasing lipid peroxidation and corticosterone levels.
- In rats, triphala protects against noise-induced alterations in antioxidant and cell-mediated immune response.

4. Benefits of Triphala for Joint:

- Triphala prevented monosodium urate crystal-induced arthritis in mice (gouty arthritis) by reducing various parameters like paw volume, lysosomal enzymes, β -glucuronidase lactate dehydrogenase lipid peroxidation, and the proinflammatory cytokine tumour necrosis factor-alpha, according to research.
- It might have potential use in the treatment of gout in humans, however, more studies are needed for the same.¹

5. Benefits of Triphala for Digestive Tract:

- Castor oil-induced diarrhoea was prevented by extracts of triphala churna powder and triphalamashi.
- The extracts had a strong antidiarrheal effect, as demonstrated by increased first defecation time, cumulative faecal weight, intestinal transit time, improved stool volume, stool

frequency, stool consistency, decreased mucus level in stool, and flatulence.

6. Benefits of Triphala for Liver:

- In mice, triphala was found to be beneficial against acetaminophen-induced liver damage, but with less efficacy than silymarin.
- Triphala lowered the levels of proinflammatory cytokines and lipid peroxides while also restoring the levels of many antioxidant enzymes and reducing liver damage as seen by lower liver enzyme values.¹

7. Benefits of Triphala for Diabetes:

- Animal studies have demonstrated that giving the same amount of triphala and its separate ingredients to normal and alloxan-induced diabetic rats lowered serum glucose levels.
- Thus, with more research, triphala might be useful in treating diabetes in humans

8. Benefits of Triphala for Obesity:

- After the treatment of mice with triphala in an anti-obesity study, their body weight was observed to be lower when compared to control animals.
- Gallic acid is a phenolic molecule found in triphala that was chosen as the bioactive marker because of its anti-obesity activity.

9. Benefits of Triphala for Heart:

- Triphala has been found to have a lipid-lowering impact on rats, with significant reductions in total cholesterol, low-density lipoprotein, very low-density lipoprotein, and free fatty acid, indicating hypocholesteremic condition.¹
- These properties make it cardio-protective.

10. Benefits of Triphala for Skin:

- The topical application of triphala extract aided wound healing in rats infected with a variety of bacteria, according to a study.
- Experiments revealed that the triphala ointment reduced bacterial count and promoted wound closure by increasing collagen, hexosamine, and uronic acid levels.

11. Benefits of Triphala for Radioprotective activity:

- Triphala has been proven in preclinical trials to have radioprotective properties when taken orally.
- The most effective action of triphala was seen when given before irradiation, lowering DNA damage in both blood white blood cells and

spleen cells, the normalizing activity of certain enzymes like xanthine oxidase and super oxidase dismutase found in the intestine.

- This indicates that the observed effects were mediated through inhibition of oxidative damage in the cells and organs.¹

12. Benefits of Triphala for Immunity:

- Triphala has been shown to have potent immunomodulatory properties in a variety of animal models.
- Flavonoids, tannins, alkaloids, glycosides, saponins, and phenolic substances are thought to have immunomodulatory properties.
- Triphala treatment increased antioxidant activity and lowered corticosterone levels in animals exposed to noise stress, according to research.

13. Benefits of Triphala for Antioxidant activity:

- According to research, taking triphala boosts the activity of antioxidant enzymes which may have resulted in a considerable reduction in stomach cancers in mice.
- When rats were given triphala and were subjected to noise stress, similar results were reported.
- Such findings point to triphala's ability to act as an antioxidant and to protect against a variety of stressors and illnesses.

14. Benefits of Triphala for Eyes:

- Triphala was found to be beneficial in preventing and reducing selenite-induced cataract formation, according to a study.
- In animal trials, triphala restored antioxidant enzyme levels, resulting in a reduction in nuclear cataracts. As per Ayurveda, triphala can also help prevent blindness and near-sightedness.

15. Benefits of Triphala for Cancer:

- In cancer studies, triphala has shown killing activity on cancer cells.
- Its main component gallic acid may be responsible for stopping cancer cell growth.
- An increased concentration of triphala was found to reduce the viability of breast cancer cells while having no effect on normal breast cells.
- In breast cancer cells, triphala caused an increase in intracellular reactive oxygen species.

16. Benefits of Triphala for Aging:

- On human skin cells, triphala extract has a strong antiaging effect.
- It stimulates collagen-1 and elastin-synthesizing genes and antioxidant genes responsible for cellular antioxidants in human skin cells.
- Due to the presence of protective phytochemicals, it suppresses melanin synthesis and hyperpigmentation.⁴

How to Use Triphala

1. Triphala churna (Powder):

Haritaki, bibitaki, and amlaki are powdered to make triphala churna (powder). As per research, it is advisable to take it with ghee, honey, or milk.

2. Triphala kwatha (Decoction):

It is made by combining the powder with water and boiling it. The decoction is then filtered through a clean cloth, and the filtrate can be used to treat skin conditions like erysipelas, eruptions; scrotal enlargement, colic pain, worm infestation, and urinary diseases. It is applied directly to open wounds and eyes, as well as gargled during pharyngitis.

3. Triphala taila (Oil):

It is made by boiling triphala powder with oil. It is used as a gargle, snuff, an enema, and orally to treat obesity and itching.

4. Triphala masi (Ash):

It's made by heating triphala powder for a long time at a low temperature in a controlled setting. Mashi/Masi is an intermediate product containing organic and inorganic ingredients. The mashi is black and has a high carbon and oxide content. Triphala masi, when mixed with honey, can be used to treat soft chancres and wounds.

5. Triphala gritha (in ghee or clarified butter):

It is made by cooking the paste of triphala, trikatu (a herbal compound of Indian Long Pepper (*Piper longum*), Black Pepper (*Piper nigrum*), and Ginger (*Zingiberofficinale*) in ghee and milk, as well as grapes (*Vitisvinifera*), Yestamadhu (*Glycyrrhizaglabra*), Kutki (*Picrorhizakorroa*), and cardamom (*Elettaria cardamom*). It is frequently used to treat eye conditions like conjunctivitis, blindness, and cataracts. Triphala gritha is also used to treat jaundice, leucorrhoea, tumours, greying, and hair loss.

II. CONCLUSION:

The inclusion of traditional herbal healers in the health care system especially in primary healthcare team in developing countries could improve quality of life and safety standards and their use as a complimentary therapy could play a role in the palliative care of people living with HIV/AIDS.

While many years of herbal use in traditional settings can be used as a testimony that a particular herbal ingredient is effective or safe, several problems need to be addressed. It is now known that ingredients that form part of herbal preparations are incorporated into Modern practice and are now used in developed countries as part of Health promotion or disease prevention strategies. One of the most difficult issues to contend with in translating traditional herbal practices into conventional western medicine is the individualization of Prescription containing multiple herbal and other ingredients. Whether backed by medical science or simply by years of use, traditional treatments remain popular and as more research is carried out, some may play a complementary role in modern medicine there is an urgent need for educational intervention with regard to Herbal medicine in the training of our physicians. We propose that an Integration of herbal medicine into the current medical curriculum so That future physicians would be better prepared to communicate with their patients on this healthcare modality. Continuing education programme are also recommended so that practicing physicians would have the opportunity to upgrade their knowledge in this rapidly expanding area of significant public health concern. A considerable proportion of HIV/AIDS patients used herbal medicine concomitantly with ART at TASH, Ethiopia. The determinant factors for use of herbal medicine were female gender, age above 60, experiencing OIs and developing side effects from ART.

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