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Ethnomedicinal survey of medicinal plants used for the management of HIV/AIDS infection among local communities of Nkonkobe Municipality, Eastern Cape, South Africa

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An ethnomedicinal survey was conducted on medicinal plants used for the management of HIV/AIDS infection in the local communities of Nkonkobe Municipality, Eastern Cape Province. Information was obtained through a well-structured questionnaire and interviews administered to traditional healers and herbalists in various regions. The survey revealed 18 species belonging to 12 families. The members of Asphodelaceae (22.2%), Apocynaceae (16.7%), Asteraceae (11.1%), Mesembryanthemaceae (5.6%) and Hypoxidaceae (5.6%) were frequently mentioned by the traditional healers and rural dwellers of the regions. The decoction of Aloe ferox, Bulbina asphodeloides and Carpobrotus edulis roots and leaves are commonly administered for the management of HIV/AIDS infection. Other opportunistic diseases treated using the roots of these plants include tuberculosis, diabetes mellitus, sores, high blood pressure, intestinal worms and constipation. Most of the extracts of these plants are administered orally for a very long period of time, depending on the age and physical well-being of the patients. Generally, children are given half the dosage for the adults depending on the severity of the illness.

Key words: Medicinal plants, HIV/AIDS infection, traditional knowledge.

INTRODUCTION

South Africa is known to have the largest antiretroviral therapy (ART) on the planet, with about 1.3-million people currently receiving treatment (Richard, 2011). With over 42 million people living with HIV/AIDS, expanding access to antiretroviral treatment for those who urgently need it, is one of the most pressing challenges in international health care centres (Richard, 2011). In a population aforementioned, only 13.7% have access to medical insurance. Many cannot afford ART as a result of the high cost and poverty (UNAIDS/UNICEF, 2010; Motsoaledi, 2011). Eastern Cape Province happened to be the third largest burden of HIV and AIDS in South Africa with an estimates of six million, seven hundred and forty-three thousand eight hundred (6,743800) people living with the virus in 2010 (Shisana et al., 2009). It is the poorest provinces with the highest infant mortality rate facing majority of the population (Shisana et al., 2009). Many people living with this ailment in this province are also vulnerable to other diseases associated with HIV infection, such as tuberculosis, diabetes mellitus, high blood pressure, intestinal worms and constipation that result from immunosuppression (Statistics South Africa, 2008). It is clear that approximately 80% are unemployed, and household income is derived through the informal sector and social grants (Statistics South Africa, 2008).

Due to several constraints of receiving antiretroviral therapy treatment as aforementioned, most HIV-infected persons still use ethnomedicines to manage AIDS-related opportunistic infections (Wilfred et al., 2011). In majority of African countries including South Africa, traditional healers play a crucial role in providing primary health care including taking care of people living with meningitis, pneumonia, endocarditis and diabetes mellitus.
(Matsushita, 2000; Eron, 2009; Nakanjako et al., 2009; Moszynski, 2009). Plant medication is believed to be an important healthcare system, which mainly involves the use of locally available medicinal herbs (Yadava and Jithendra, 2008). Promising results have been achieved through the evaluation of plant derived compounds against several opportunistic infections (Yadava and Jithendra, 2008). In Nkonkobe Municipality, the percentage (1.77%) of infected people that have access to antiretroviral therapy from this locality is reasonable high (Yadava and Jithendra, 2008). Herbal medicine still remains the main resource of management of diseases related to HIV/AIDS infected people living in the local communities. The wide spread use of traditional medicine among these communities could be attributed to cultural acceptability, economic affordability and efficacy against certain type of diseases as compared to modern medicines.

Local communities have indigenous experience in various medicinal herbs where they use their perceptions and experience to categorize plants part to be used when dealing with different ailments (Erasto et al., 2005; Wyk et al., 2008). Moreover, the use of plants as medication over the past period of years has taken a huge opportunity for local communities’ development and livelihood improvement (Wyk et al., 2008). However, documentation of these plants and their various uses is scanty in literature. The present study reports the local and scientific names of the plants used for the management of HIV/AIDS in the local areas (Figure 1), as well as the parts of the plants used and the various methods of preparation and administration.

MATERIALS AND METHODS

Description of the study area

Nkonkobe Municipality is an area in South Africa that is situated between 32° 47’ S and 26° 50’ E. The area is bounded by the sea in the east and drier Karoo in the west. The altitude is approximately 1300 m above sea level and the vegetation is veld type 7 (Masika and Afolayan, 2003). The major ethnic group is Xhosa speaking people with farming as their main occupation. People of the region use herbal medications either alone or in combination with antiretroviral medicines for the treatment of viral diseases. Majority of them in the area are traditional healers and rural dwellers, hence the use of plants for the treatment of common diseases, such as HIV/AIDS is very common.

Survey on the use of medicinal plants

The ethnobotanical survey of this study was collected from May to September 2011 using a structured questionnaire and interviews. Prior to the administration of the questionnaire, a conversation with the informants in the survey was identified by the regional HIV/AIDS coordinator and the chairperson of the local traditional healers. He persuaded the association representative to elaborate the objective of the research and seeking their consent about the medicinal plants for diagnosing HIV/AIDS, name of the plants, methods of preparation, duration of treatment and adverse effects. The age of respondents ranged from 10 to 60 years with average and low education qualifications. Traditional healers were paid some substantial amount of money before they agree to be used as guides during field trips to collect plant specimen. Voucher name of the reported anti-HIV plant was later identified by Prof D. S. Grierison of Botany Department, University of Fort Hare. Specimens were deposited (Omo 2011/1 to Omo 2011/19) at the Giffen Herbarium.

RESULTS AND DISCUSSION

The traditional healers and rural dwellers employed in this study claimed to diagnose HIV/AIDS infection in their patients by observing common symptoms such as chronic diarrhoea, persistent cough, progressive weight loss, and skin infection. Extracts from medicinal plant are taken orally for a long period of time, depending on the severity of the ailment. Thus the effect of medicinal plants treatment on the patients following administration according to the traditional healers can help to boost the immune system against viral attack in the human body. In recent past, a number of studies have explored immunostimulatory properties of plant extracts having antiviral properties (Supinya et al., 2006; Pascal et al., 2004; Webster et al., 2006).

Our survey revealed 18 important plant species documented by herbalists, traditional healers and local people from different communities in Nkonkobe Municipality for the management of HIV/AIDS infection (Table 1). The survey plants revealed 18 species belonging to 12 families. The members of Asphodelaceae (22.2%), Apocynaceae (16.7%), Asteraceae (11.1%), Mesembryanthemaceae (5.6%) and Hypoxidaceae (5.6%) were frequently mentioned by the traditional healers and rural dwellers of the regions. But the decoction of Aloe ferox, Bulbine asphodeloides and Carpobrotus edulis roots and leaves are commonly administered for the management of HIV/AIDS infection. Other opportunistic diseases treated using the roots of these plants include tuberculosis, diabetes mellitus, sores, high blood pressure, intestinal worms and constipation. However, the active chemical compounds and their modes of action of the surveyed plants were unknown, but it is possible that these plants may contain some bioactive secondary metabolites that work against viral related infections. Hypoxidaceae are the most predominant plants that are used by the sangoma’s in Dhlawu and Ngcabasa for boosting the patient immune system, cleansing the blood vessels and improving the appetite. Previous studies have reported that the Apiaceae and Hypoxidaceae are rich in sterols, sterolins, tannins, triterpenes, and flavonoids that help treat HIV related diseases, such as acute diarrhoea, dermal ulcers, general skin eruptions, coughs, colds, influenza, fever, headache and abdominal pains (Ernst and Coon, 2001; Singh et al., 2005; Kisangau, 2007). Helichrysum
cymosum belonging to a family of Asteraceae species is mainly used for the treatment of skin infection and kidney infection. In Tanzania, Asteraceae, Lamiaceae, Rubiaceae and Rutaceae are predominantly used by traditional healers to manage HIV/AIDS infections; including rheumatism, urinary tract, wounds, kidney infection and stomach ache. They were also reported to contain terpenoids. Terpenoids are biological compounds that can enhance and maintain the body immunity (Wagner et al., 2003; Thring and Weitz, 2005; Kisangau et al., 2007).

In this survey, different parts of plants were used by the local traditional healers. Among the different parts, roots were most frequently used, followed by the leaves, stems, and bulbs which are in accordance with studies conducted in Ethiopia, on herbal preparation for HIV/AIDS infections treatment (Abebe, 2003; Thring and Weitz, 2005; Kisangau et al., 2007).

The decoction of the roots of Bulbine asphodeloides (ltswele), Xysmalobium undulatum (ltshongwe), Aloe ferox, Aloe tenuior, (Umhlaba), Aloe (generic) (likhala) and Hypoxis hemerocallisidea also known as inongwe were frequently mentioned by the traditional healers and herbalists for the treatment of other opportunistic diseases including tuberculosis, diabetes, sores, high blood pressure, intestinal worms and constipation. H. hemerocallisidea leaves are widely used as incense to invoke the goodwill of their ancestors; the smoke is sedative and helpful for insomnia. Elderly men and women leaving in rural villages in Nknonkobe inhale it as protective cleanser of the lungs. Information from other literature revealed that these plants were used for the treatment of many other diseases besides HIV/AIDS infection (Van Wyk et al., 1997). The leaves extract are used to treat stomach-ache and mouth antiseptic (Van Wyk et al., 1997). The management of these herbal species as drugs are currently recommended by the South African Ministry of Health for HIV management (Ernst and Coon, 2001).

Carpobrotus edulis (Igukuma) roots and leaves boiled with water or alcohol are described as a popular remedy used orally for treating tuberculosis, dysentery, diabetic mellitus, stomach cramps, laryngitis, sore throat and mouth infections, The leave extract is used as a soothing lotion for burns, scrapes, bruises, cuts, sunburn, ringworm, eczema, dermatitis, herpes, nappy rash, thrush, cold sores and cracked lips. In other part of Africa, the infusion of fruits is used as a very powerful remedy for constipation, a mixture of the leave extract, honey and olive oil in water is a remedy for tuberculosis (Smith et al., 1998). It also has significant medicinal uses in pregnant women during pregnancy to ensure strong, healthy baby and an easy birth control. In the Eastern
Table 1. Medicinal plants used for the management of HIV/AIDS infection in the local communities of Nkonkobe Municipality, Eastern Cape Province, South Africa.

<table>
<thead>
<tr>
<th>Plant species</th>
<th>Local names</th>
<th>Therapeutic indications</th>
<th>Parts used</th>
<th>Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alepidea amatymbica Eckl. and Zeyh., (Apiaceae)</td>
<td>Inkatazo</td>
<td>Diarrhoea, clean-up blood vessels and improves patients appetite</td>
<td>Root and bark</td>
<td>Root and bark are boiled. Two-three tea spoons of the infusion are administered to children, while half a cup is given to an adult once a day.</td>
</tr>
<tr>
<td>Aloe ferox, Mill., (Asphodelaceae)</td>
<td>Umhlaba</td>
<td>Dysentery, skin infections sores, and cough</td>
<td>Root</td>
<td>Decoctions are made from roots and half a cup is three times a day.</td>
</tr>
<tr>
<td>Aloe tenuior, Haw., (Asphodelaceae)</td>
<td>Umhlaba</td>
<td>Boost immune system, diarrhoea, heal sores caused by skin infections</td>
<td>Root</td>
<td>Decoctions are made from roots and half a cup is three times a day.</td>
</tr>
<tr>
<td>Aloe (generic), A. africana Mill., A (Xanthorrhoeaceae)</td>
<td>Ikhala</td>
<td>Cures tuberculosis, cleans the blood vessels and help boost appetite</td>
<td>Root</td>
<td>Root decoction (full tea spoon) taken orally till the patient gets better.</td>
</tr>
<tr>
<td>Aloe arborescense Mill., (Asphodelaceae)</td>
<td>Ingcelwane</td>
<td>Immune system booster, diabetes and high blood pressure</td>
<td>Leaves</td>
<td>Leaves are boiled in water and a full cup is administered orally till the patient immune system improves.</td>
</tr>
<tr>
<td>Bulbine asphodeloides (L.) Willd., B. (Asphodelaceae)</td>
<td>Itswele</td>
<td>Cures tuberculosis, cleans the blood vessels and help boost appetite</td>
<td>Root and leaves</td>
<td>Decoction of the roots and leaves (full tea spoon) are administered three times a day till the patient is healed.</td>
</tr>
<tr>
<td>Carpobrotus edulis (L.)Bolus (Mesembryanthemaceae)</td>
<td>Igcukuma</td>
<td>Skin infection as a result of fungal infection, gastrointestinal complaints sores, remove shingles from HIV patient, boost immune system</td>
<td>Leaves and root</td>
<td>Leaves and roots are crushed in boiled water and half a cup is administered under standardized conditions.</td>
</tr>
<tr>
<td>Citrus limon L /W4. (Rutaceae)</td>
<td>Ulamula</td>
<td>High blood pressure and diabetes mellitus</td>
<td>Fruits</td>
<td>Fruits are mixed with boiled water and half a cup is administered orally.</td>
</tr>
<tr>
<td>Helichrysum cymosum L /W5. (Asteraceae)</td>
<td>Imphepho</td>
<td>Diarrhoea, improves appetite, boost immunity and removing of evil spirit from patients</td>
<td>Fruits and leaves</td>
<td>Fruits and leaves are mixed with boiled water and half a cup is administered orally.</td>
</tr>
<tr>
<td>Hydnora Africana, Thunb., (Hydnoraceae)</td>
<td>Umavumbuka</td>
<td>Cardiovascular diseases and Diarrhoea</td>
<td>Leaves</td>
<td>Leaves are boiled in water and 2 tea spoons are administered to little children and half a cup for an adult 2 times a day.</td>
</tr>
<tr>
<td>Hypoxis hemerocallidea FischandC.A., (Hypoxidaceae)</td>
<td>Inongwe</td>
<td>Cleans the blood vessels, remove sores, improves appetite and immune booster</td>
<td>Root</td>
<td>Half a cup of root decoction is taken orally till the patient gets better.</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Part Used</td>
<td>Treatment/Use</td>
<td>Part Used</td>
<td>Treatment/Use</td>
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<tr>
<td>Leonotis leonurus, (L.) R.Br., (Lamiaceae)</td>
<td>Utywala</td>
<td>Intestinal worm infections, and constipation</td>
<td>Bulb</td>
<td>Bulb infusions are taken orally.</td>
</tr>
<tr>
<td>Nerine filifolia Baker (Amaryllidaceae)</td>
<td>Itswele</td>
<td>Treatment of virginal infection (candidacies) and sores from fungal infection</td>
<td>Root</td>
<td>Grated roots are boiled in water and taken orally, until patient is completely cured.</td>
</tr>
<tr>
<td>Olearia moschata, (Asteraceae)</td>
<td>Incense</td>
<td>Diarrhoea, abdominal cramps, improves appetite, boost immunity and removing of evil spirit from patients</td>
<td>Bark</td>
<td>Bark is boiled and half a cup is taken orally.</td>
</tr>
<tr>
<td>Pachycarpus concolor E.Mey., (Apocynaceae)</td>
<td>Itshongwe</td>
<td>Treatment of tuberculosis, high blood pressure and immune boosting</td>
<td>Leaves</td>
<td>Leaves are boiled in water and half a cup is administered orally till the patient immune system is boosted.</td>
</tr>
<tr>
<td>Strychnos henningsii Gilg. NW6 (Loganiaceae)</td>
<td>Umnonono</td>
<td>Gastrointestinal disorder, help boost immune systems, diarrhoea and easy menstrual pain</td>
<td>Leaves</td>
<td>Leaves are boiled in water and half a cup is administered three times a day.</td>
</tr>
<tr>
<td>Xysmalobium orbiculare (E.Mey.) D. Dietr., (Apocynaceae)</td>
<td>Itshongwe</td>
<td>Treatment of tuberculosis, cough, high blood pressure and immune boosting</td>
<td>Root</td>
<td>Fresh root boiled in water and the decoction is taken orally.</td>
</tr>
<tr>
<td>Xysmalobium undulatum (L.) W. T. Aiton, (Apocynaceae)</td>
<td>Itshongwe</td>
<td>Cancer, and help enhance the immune defence</td>
<td>Root</td>
<td>Decoctions are made from roots and half a cup is taken orally till the patient gets better.</td>
</tr>
</tbody>
</table>

Cape it is also used to fight fatigue, vaginal thrush, toothache, earache, and spiritual purposes (Smith et al., 1998; Van Wyk et al., 1997).

**Preparation and dosage administered to individual patients**

Plants are collected at anytime of the year, depending on their seasonal availability, preferably in the morning. The observed methods of preparation involved the use either water or alcohol of only a single plant part. Decoctions and infusions were the main methods of preparation. Most of the extracts of these plants are administered orally for a very long period of time, depending on the age and physical well-being of the patients. Generally, children are given half the dosage than for the adults depending on the severity of the illness.

**Conclusion**

This survey has revealed 18 medicinal plants for the management of HIV/AIDS infection and their current use in the treatment of other related diseases. However, we have decided to work with C. edulis and B. asphodeloides. The fact that these plants are used in the management of HIV/AIDS infection, calls for the investigation of their antimicrobial activities, anti-tuberculosis activities, anti-diabetes activities and HIV/AIDS causing enzymes such as HIV protease, DNA integrase and reverse transcriptase and other related bacteria. Phytochemical, antioxidant and toxicity studies of these plants will be carried out, to enable identification of active chemical constituents and cautions to be issued of dangerous practices or its toxic effects.

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REFERENCES


Motsoaledi A (2011). ‘How we’re re-engineering the health system - Health Budget Vote Policy Speech presented at the National Assembly’ politicsweb.co.za.


