

Traditional medicine use and the anaesthetist

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This review considers traditional medicine, with an emphasis on traditional African medicine and its influence on perioperative care. Western and Eastern herbal remedies are widely used. The paucity of good quality evidence concerning these medicinal products has led to only some of the effects of these medicines being known. The wide range of preparatory methods and lack of regulation has resulted in patient exposure to unknown side-effects. The nature of the use of African traditional medicine is even less known, and probably disclosed to the Western health practitioner even less. This review aims to raise awareness of African traditional medicine healthcare practice and its implications in a perioperative population.

Keywords: alternative medicine, herbal remedies, traditional health care, traditional medicine and anaesthesia

Introduction

The World Health Organization (WHO) defines traditional medicine as diverse health practices, approaches, knowledge and beliefs that incorporate plant-, animal- and/or mineral-based medicines, spiritual therapies, and manual techniques and exercises, which are applied singularly, or in combination, to maintain well-being, as well as to treat, diagnose or prevent illness.¹

It is estimated that up to 80% of Africans prefer the use of traditional medicine over Western medicine for their healthcare and psychosocial needs.² The estimate with regard to patients presenting for surgery, extrapolated from international literature on complementary and alternative medicine (CAM) use, is likely to be higher.^{3–7}

The lower traditional medicine practitioner to patient ratio, as compared to the very high Western healthcare practitioner to patient ratio, means that it is often a necessity, rather than a choice, for many South Africans.⁸ Approximately 300 000 traditional practitioners were estimated to be practising in South Africa, compared to 250 000 allopathic medicine practitioners, towards the end of the 1990s.⁹ The WHO estimates that traditional healers in Africa cover 80–90% of health care.¹

Judging from American and British literature on CAM use, it is apparent that there are potentially serious side-effects and drug interactions that can affect the perioperative course of patients using CAM, and therefore concerns regarding the perioperative use of such medicines in that setting are valid and numerous.^{3,7} The possible harmful effects of CAM use have been alluded to by many authors.^{10–12} Various toxic ingredients, including heavy metals, such as mercury, lead, nickel and arsenic, have been found as ingredients in overseas remedies. Arsenic was identified in 36, mercury in 35 and lead in 24 of 251 herbal products in stores in California, in the USA.¹³

The eight most common herbal remedies used in the Western setting include garlic, echinacea, ephedra, St John's wort, ginkgo biloba, ginseng, kava and valerian.³ The associated clinical implications are significant and are illustrated in Table 1.

Such effects can make the performance of a surgical technique or an anaesthetic procedure, such as a neuraxial block, potentially harmful. It is for this reason that determining the true nature of perioperative CAM use, and especially traditional medicine use, in our setting is so important.

The regulation of the distribution of complementary and alternative medicine versus traditional medicine

In the UK, the Traditional Herbal Medicines Registration Scheme has set out safety and quality standards for herbal medicines that are mass produced and sold over-the-counter. Registered manufacturers are obliged to monitor the safety of their products once they are on the market. Currently, herbal remedies used in the UK that are not mass produced are exempt from the need for a license. Details of herbal products found to contain potentially harmful ingredients, or which interact with conventional medicines, can be posted on the Medicines and Healthcare Products Regulatory Agency's website.¹⁴

The situation is not that much different in the USA, where The Dietary Supplement Health and Education Act of 1994 classifies herbal remedies as dietary supplements, exempting these herbal medications from the safety and efficacy requirements and regulations that prescription and over-the-counter drugs must fulfill.¹⁵ In addition, there is no central mechanism for mandatory reporting as there is for conventional medications, and as a result, adverse events are under-reported.

In South Africa, the Medicines Control Council clearly distinguishes between CAM and African traditional medicine because of the magnitude of the traditional medicine trade in South Africa and its cultural significance.

The recently amended Medicines and Related Substances Act, 1965 (Act No 101 of 1965) provides for the regulation of allopathic and complementary medicines only, but does not adequately provide for the regulation, registration and control of African traditional medicine. According to the Medicines and Related Substances Act, "complementary medicine" means any substance or mixture that:

Table 1: Complementary and alternative medicine and the associated clinical side-effects

Garlic (<i>Allium sativum</i>)	Excessive use has been shown to increase the risk of bleeding in surgical patients. Garlic is used to lower serum lipid and cholesterol levels. However, it has a potential effect on platelet aggregation in a dose-dependent manner. ^{16–18}
Echinacea (<i>Echinacea purpurea</i>)	Echinacea is commonly used as an immune system stimulant. Its immune effect can play a role in transplant organ rejection in the long term. ¹⁹
Ephedra (<i>ma huang</i>)	Ephedra has sympathomimetic effects. Chronic use thereof can potentially affect the cardiovascular system function, potentially leading to cerebrovascular events and myocardial ischaemia. ^{20,21}
St John's wort (<i>Hypericum perforatum</i>)	St John's wort has been shown to lead to the central inhibition of serotonin, noradrenaline and dopamine. It is also an enzyme inducer, causing the induction of cytochromes P450 3A4 and 2C9. ^{22–24}
Ginkgo biloba	Ginkgo biloba has been shown to inhibit the platelet-activating factor. In addition, it has antioxidant activity and modulates neurotransmitter activity. ^{25–28}
Ginseng (panax)	The mechanism behind ginseng is poorly understood. It has been shown to inhibit platelet aggregation and to lead to the prolongation of activated partial thromboplastin time. ^{29,30}
Kava (<i>Piper methysticum</i>)	Kava is used to treat anxiety and is also a sedative. In addition, the kavalactones have antiepileptic and local anaesthetic properties. ³¹
<i>Valerian officinalis</i>	<i>Valerian officinalis</i> modulates gamma-aminobutyric acid neurotransmission, leading to dose-dependent sedation and hypnosis. ³²

- Originates from plants, minerals or animals.
- Is used or intended to be used for, or manufactured or sold for use in assisting the innate healing power of a human being or animal to mitigate, modify, alleviate or prevent illness or the symptoms thereof, or an abnormal physical or mental state.
- Is used in accordance with the practice of the professions regulated under the Allied Health Professions Act, 1982 (Act No.63 of 1982).³³

Traditional medicine does not fall under the abovementioned act.

CAM practitioners are controlled by the professional boards of the Allied Health Professions Council of South Africa. African traditional medicine is classified separately from other CAM, and does not fall under the Allied Health Professions Act, 1982 (Act No. 63 of 1982).³³

This allows for the distribution of traditional medicine without strict regulation of content, dose and purity. Lack of regulation of these medicines has considerable implications for the perioperative management of these patients.

Classification, training and regulation of traditional practitioners in South Africa

Various classifications of traditional healers are seen in South Africa, including diviners, herbalists, prophets or faith healers and traditional surgeons, and the reasons for seeking such care are also diverse. Patients seek traditional practices for a variety of medical and psychosocial reasons.

These include, but are not limited to, medical illnesses, human immunodeficiency virus (HIV) and related disorders, sexual dysfunction, child birth and pregnancy.⁹

On 12 February 2013, the South African Ministry of Health inaugurated the Interim Traditional Health Practitioners Council of South Africa.³⁴ The council includes members from traditional health care (diviners, healers, traditional birth attendants and herbalists), the Health Professions Council of South Africa and the South African Pharmacy Council. This step is aimed at integrating African traditional medicine into the national health system in South Africa, and to allow for better consumer service and regulation as a result. The Traditional Health Practitioners Bill (Bill 20 of 2007) was approved in 2007 and the Traditional Health Practitioners Act (No 22 of 2007) was signed into law in 2008.^{35,36}

This will help to ensure a regulatory framework for the traditional health practitioners council for the registration, education and regulation of traditional healers, if and when established.

Currently, there is no standardisation and means of measuring the competence of a traditional healer. Indeed, how would a belief or a communication with ancestors be regulated? There is also no functioning body with which a traditional practitioner may register. As a result, there are numerous opportunities for unfair profiteering. An interview of traditional healers in Johannesburg revealed a training duration ranging from three months to three years. None of the trainees were specifically taught which plant to use for which condition.³⁷

Factors affecting the content of traditional medicine remedies

Apart from lack of regulation of the content, various pharmaceutical and non-pharmaceutical factors affect the efficacy and toxicity of traditional herbal medications. The concentration of various pharmacologically active ingredients may vary within the same plant. Possible factors for this include the plant's growth environment (a seasonal variation in the chemical constituents), harvesting conditions, as well as storage conditions.^{38,39} Storage conditions may lead to contamination of the product with mycotoxins, insects and bacteria. The possibility of misidentification of plant material also exists, especially as plant collectors often sell already processed plants to traditional healers. Determining an accurate dose may be problematic as some medicine may be less toxic to adults and more toxic to children for physiological reasons. There are often multiple ingredients in the mixtures, which makes it impossible to discern the active ingredient.

Some plants may be useful as pure irritants to induce vomiting for ritualistic cleansing and their inadvertent absorption may result in harm.

Research in this field is also fraught with obstacles. Allopathic medicine lies within the realm of research, and traditional medicine within the domain of mystica (belief and religion).⁴⁰ The belief in the medicine itself, as well as the psychological effects of having a healer who communicates in a manner that is culturally relevant, as well as using one's own language, may be all that is needed for cure in certain cases. Other obstacles to research in this field were revealed in a training needs assessment of researchers in African universities who were planning on conducting research on herbal medicines. The researchers raised resource constraints, lack of herbal medicine supplies and lack of trained staff as some of the logistical issues that they faced.⁴¹

The beneficial effects of traditional medicine use

Despite many shortcomings, there are a number of advantages to the practice of traditional medicine use.

Allopathic medicine evolved from a system of beliefs and natural remedies that were found to have medicinal effects, which were then refined and adopted. Twenty-five per cent of drugs currently in use are substances that were first isolated from plants. A further 25% are modifications of chemicals that were first isolated from plants.⁴² The possibility exists that many of these used ingredients may have a broader clinical use in the future.

Further advantages are that the healers and their explanations of the disease process are culturally familiar and involve the use of everyday language. The healers often speak the same language.⁴³ This may allow for better practitioner patient understanding and compliance.

Traditional health practitioners enjoy credibility and respect from the communities that they serve, regardless of the socio-economic status of members of the community.⁴⁴ Many people who prefer traditional medicine use may find it necessary to visit allopathic practitioners for healthcare-unrelated reasons, such as the provision of sick notes, as many employers have concerns about accepting sick notes from traditional healthcare practitioners. Medical schemes are also biased towards claims from allopathic practitioners, which results in patients having to pay for traditional health practitioner services from their own financial means. It is noteworthy that countries such as Vietnam, China, the Democratic People's Republic of Korea and Republic of Korea have integrative national health systems in which traditional medicine is incorporated into all aspects of health care. This is in contrast to South Africa which has a tolerant system, i.e. national health care based on allopathic medicine and some traditional practices being tolerated by law.⁴⁵ In reality, the two systems seem to co-exist. Many patients are content with consulting both allopathic and traditional medicine, often for the same health issues.

The situation regarding acceptance is slowly changing as evidenced by the recent inauguration of the Interim Traditional Health Practitioners Council of South Africa. Advances are being made, with some institutions now accepting sick notes from traditional healers, with certain restrictions.⁴⁵ The recent labour court ruling and subsequent Supreme Court of South Africa appeal ruling on Kievits Kroon Country Estate (Pty) Ltd versus Mmoledi and Others is further evidence of a drive towards the acceptance of traditional healer practices.^{46,47}

The incorporation of traditional healers in modern health care may improve the health care of many South Africans who consult them first before seeking Western medicine. The delay in seeking Western care, which often means an advanced disease process on presentation, might be alleviated, and patients with diseases that the traditional healer cannot manage could be referred early. The collaboration could also help with the study and research of the medicinal plants that they use.

The clinical implications of traditional medicine use

Human immunodeficiency virus and acquired immune deficiency syndrome

As many as 90% of patients living with HIV and acquired immune deficiency syndrome consult traditional health practitioners first before consulting allopathic medicine practitioners for a variety of reasons, which include supernatural or psychosocial problems, chronic conditions, acute conditions, generalised pain, and HIV

and other sexually transmitted infections. A significant number use antiretroviral drugs and traditional medicine concurrently. Some stop their antiretroviral regimen as a result of the side-effects and use traditional medicine as their only treatment.⁴⁸ The anaesthetist should be aware of the alarming high rate of traditional medicine use in this group, compounded by possible interactions with antiretroviral therapy.

Obstetrics

A study by Morris and Mdlalose found that up to 75% of pregnant Zulu women visited traditional healers during pregnancy.⁴⁹ Another local study confirmed this high number, and reported that 55% of pregnant women interviewed in early labour had taken herbal medication at some stage during their pregnancy. It was concerning that 48% had taken such remedies 12 hours before admission to the hospital.⁵⁰

It is notable that up to 57 plants are used in combination in these remedies, some potentially toxic, making it difficult to identify the active or toxic component.⁵¹

Plant extracts associated with uterine hyperstimulation are used by traditional birth attendants during deliveries.^{51,52}

The use of *Isihlambezo* (*Rhoicissus* extract) during pregnancy has been associated with premature delivery and growth retardation. *Isihlambezo* ("that which cleans") is a concoction made from various herbs commonly taken during pregnancy. It has been associated with the passage of meconium-stained liquor and a higher Caesarean section delivery rate. *Rhoicissus tridentata* subspecies *cuneiform*, also known locally as *Isinwazi* (Zulu) has been shown to have direct activity on the uterine muscle. It stimulates concentration-dependent contractions of both the isolated uterus and ileum in vitro. Assuming good absorption from the gastrointestinal system, and no or minimal first-pass metabolism, the plant could possibly stimulate contractions in vivo.³⁷

Renal dysfunction

The kidney is highly susceptible to potential toxicity from traditional medicine because of its high blood flow, metabolic activity and large surface area. Reabsorption also occurs in the kidney, increasing the tissue's exposure to potentially toxic drugs.⁵³ Patients already at risk of renal dysfunction are the most at risk.

Acute renal failure resulting from the use of traditional medicine has been described, and accounts for 35% of all cases of acute renal failure in Africa.⁵³ In a local study carried out in the paediatric and adult wards of academic hospitals in Johannesburg, South Africa, renal dysfunction was reported in 76% of patients who reported having used traditional medicine. Many had co-existing pathologies, which suggests that the medicines may have not been the sole cause of the kidney injury.⁵⁴ Cape aloe (*Aloe capensis*), Bird flower (*Crotalaria laburnifolia*), Spurge (*Euphorbia matabelensis*) and Spanish fly, blister beetle (*Lytta vesicatoria*), all remedies used and found in Africa, have been implicated in various diverse forms of renal dysfunction. Electrolyte abnormalities, such as hyper- or hypokalaemia, have also been described with the use of these remedies, which, in turn, have led to complications, such as rhabdomyolysis, with notable implications for the anaesthetist.⁵⁵⁻⁶⁰

Neurological effects

The success of traditional medicine in psychological disorders is well documented.⁶¹ Over 300 species of plants are used by traditional healers for the treatment of mental health ailments in South Africa.⁶² A review of plants used in traditional South African medicines used to treat epilepsy, depression, age-related

dementia and debilitating mental illness revealed a number of effects. Extracts have shown *in vivo* anticonvulsant activity and N-methyl-D-aspartate receptor antagonism.⁶³ A northern Sotho remedy, used for the treatment of epilepsy, consisting of a combination of up to six plants, showed dose-dependent gamma-aminobutyric acid type A-benzodiazepine receptor binding.⁶⁴

Liver dysfunction

Traditional medicine use has been implicated in liver dysfunction. The ritual of cleansing and purging is common in many cultures in South Africa, and is often associated with traditional medicine use. It is not uncommon for a remedy to be taken for “womb cleansing” or “stomach cleansing”. Severe liver dysfunction associated with the use of medicine containing extracts of the tuber, *Impila* (*Callilepis laureola*), during cleansing rituals is such an example.⁶⁵ The medicine is taken in small amounts, followed by the consumption of a large quantity of water to induce vomiting. The use of a large amount, use by children, or absorption of the remedy, results in severe renal dysfunction and liver failure.^{53,55,65}

Pyrrrolizidine alkaloids, which are found in many plants commonly used in our setting, result in liver damage focused on the hepatic central vein endothelium leading to veno-occlusive disease, which progresses to liver failure. The mechanism of injury is unclear, but appears to be the result of the accumulation of reactive electrophilic metabolites.⁶⁶

The perioperative implications of traditional medicine use

There is a paucity of clear data on the interaction of African traditional medicine with drugs used in anaesthesia. The potential for adverse events, such as coagulopathy, cardiovascular instability, increased sedation, altered pharmacokinetics and pharmacodynamics of chronic medication and anaesthesia drugs, exists.

It is concerning that there might be a higher incidence of traditional medicine use with respect to members of a perioperative population as a result of them seeking alternate treatment for their illness. These patients are also at an increased risk of experiencing worsening disease symptoms due to lack of adherence to their conventional treatment in favour of “safer” alternatives.

The duration for which patients in our setting should abstain from traditional medicine before surgery is not yet known. This period is difficult to discern, and if decided upon, might not be appropriate for all traditional medicine since the content of many of the remedies used is not well studied, nor necessarily disclosed to the patient. The pharmacological effects of many of these medicines are also unknown. What is known is that effects arising from their use can potentially adversely complicate a “routine” anaesthetic.

Conclusion

It is difficult to conduct randomised control trials using traditional medicine. However, the use thereof in our setting is widespread. The true extent is not exactly known, and data are often extrapolated from CAM use statistics in the developed world. There is a concerning potential for drug interactions, and the lack of patient disclosure further compounds the problem. More studies, relevant to our setting, need to be performed in order to discern the exact plants being used and their effects.

The establishment of a council for traditional healers, as well as a formal body which regulates the production and distribution of traditional medicines, may be a difficult endeavour, but one that is

attainable and likely to protect the majority of South Africans who rely on traditional medicine practice for their healthcare needs.

Anaesthetists working in our setting should be aware of, and take into account, the use of African traditional medicine in the management of perioperative patients.

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