

Outline the pharmacology of herbal medicines. Describe adverse effects and potential drug interactions of such medicines with particular reference to the perioperative period.

1. A herbal medicine is defined as a plant-derived product used for medicinal and health purposes
2. Herbal medication use is increasing and possibly under reported as many patients do not see these as 'medications' and therefore fail to disclose them
3. Many anaesthetists do not specifically ask patients about herbal medication use
4. The ASA has recommended stopping herbal medications 2 weeks prior to the scheduled operation; however this is just a general guideline as different drugs have varying pharmacokinetics
5. Herbal preparations appear to present no added significant risk in the development of spinal hematoma in patients having epidural or spinal anesthesia. At this time, there appears to be no specific concerns as to the timing of neuraxial block in relationship to the dosing of herbal therapy, postoperative monitoring, or the timing of neuraxial catheter removal.

Medication	Purported use	Mechanism	Interactions	Anaesthetic implications	Other side effects	When to stop
Echinacea	Prevent colds and strengthen immune system	Cytokine and immune cell modulation	Hepatotoxic drugs Immunosuppressants	Avoid in patients receiving immunosuppressants / organ transplant. However, use for >8 weeks can cause immunosuppression and risk opportunistic infections Hepatotoxicity	GI symptoms Allergic rxns	Unknown
Ephedra	CNS stimulant, appetite suppressant, drug of abuse, performance enhancer	Via that of its active compounds - ephedrine (most active), pseudoephedrine, norepinephrine, and methylephedrine	MAO inhibitors Sympathomimetics Ergot alkaloids	Hypertension, cerebral and myocardial ischaemia from vasoconstriction. Prolonged use can cause a catecholamine depleted state resulting in haemodynamic instability. Fatal arrhythmias from myocardial sensitivity; caution with halothane.		24 hours
Garlic	Treatment and prevention of hyperlipidaemia and atherosclerosis, anti-inflammatory	Inhibition of platelet aggregation in a dose-dependent fashion	Anticoagulants, antiplatelets	Bleeding risk	Nausea Hypotension Allergy	7 days

Medication	Purported use	Mechanism	Interactions	Anaesthetic implications	Other side effects	When to stop
Ginkgo biloba	Improve memory	Neurotransmitter modulation and inhibition of platelet activating factor	Anticoagulants, antiplatelets	Reports of spontaneous intracranial bleeding, hyphaema, and postoperative bleeding in laparoscopic cholecystectomy	Mild GI upset	7 days
Kava	Recreational drink; sedative	GABA agonist	Sedatives and hypnotics. Parkinsonian S/Es with levodopa	Reduced anaesthetic requirements if acutely intoxicated. Can cause dystonic reactions	Kava kava dermatopathy	24 hours
St John's Wort	Antidepressant	MAO inhibitor Cytochrome P450 inducer	MAO inhibitors Sympathomimetics and tyramine containing foods Drugs metabolised via Cyt P450 pathway particularly 3A4 Pethidine	Serotonergic crisis with serotonergic drugs Altered drug metabolism Delayed emergence from anaesthesia Increases uterine tone	GI upset	5 days
Ginger	Antiemetic	Serotonin inhibitor Inhibiting arachidonic acid metabolism		Bleeding risk	Possibly mutagenic in pregnancy	Unknown
Turmeric	Antiinflammatory, antioxidant, widely used in South Asian cooking	Cytochrome P450 inhibitor	Drugs metabolised via Cyt P450 pathway particularly 3A4	Prolonged duration of cyt P450 drugs like fentanyl, midazolam, warfarin		Unknown
Ginseng	Mood enhancer, aphrodisiac, diabetes	Sympathomimetic Hypoglycaemic agent	Hypoglycaemic agents, insulin. MAOI - mania, tremor. May decrease INR if taken with warfarin	Caution in fasting patients due to risk of hypoglycaemia	Skin rash Hypotension Anxiety Insomnia	7 days
Valerian root	Sedative, hypnotic	GABA agonist	Sedatives and hypnotics	Reduced anaesthetic requirements if acutely intoxicated. Reports of liver dysfunction. Withdrawal-like syndrome with sudden abstinence		Unknown

References

1. Hodges and Kam. The peri-operative implications of herbal medicines. *Anaesthesia*, Sept 2012. <http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2044.2002.02781.x/epdf>
2. Perioperative Herbal Supplement Use in Cancer Patients: Potential Implications and Recommendations for Presurgical Screening http://www.medscape.com/viewarticle/510217_5
3. Wong and Townley. Herbal Medicines and Anaesthesia. *CEACCP* <http://ceaccp.oxfordjournals.org/content/early/2010/11/10/bjaceaccp.mkq046.full.pdf+html>
4. Batra YK, Rajeev S. Effect of common herbal medicines on patients undergoing anaesthesia. *Indian J Anaesth* 2007;51:184-92. Available from: <http://www.ijaweb.org/text.asp?2007/51/3/184/61140>
5. Horlocker T. Regional anaesthesia in the patient receiving antithrombotic and antiplatelet therapy. *BJA* 2011 http://bj.oxfordjournals.org/content/107/suppl_1/i96.full#ref-11