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### **A case of hepatotoxicity by Pelargonium sidoides**

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(mean  $\pm$  SD) after medication. *P*-value was 0.32 ( $>0.05$ ). The GPT level was  $19.62 \pm 7.95$  (mean  $\pm$  SD) before medication and  $20.69 \pm 12.16$  (mean  $\pm$  SD) after medication. *P*-value was 0.31 ( $>0.05$ ). The statistical results demonstrated no significant change in renal and liver function tests. In addition, the creatinine, GOT, and GPT levels were below the normal range. Maximum treatment period was 33 months with an average of 15.66 months.

**Conclusions:** In the present study, we found that concentrated TCM herbal extracts did not affect the renal and liver functions even after using for longer than 6 months; moreover, the longest medication period is 3 years. The concentrated TCM herbal extracts in the study were all produced in a modern GMP-certified facility. According to their strict quality control checks, concentrated TCM herbal extracts are comparatively safe.

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### PP-111

#### Cardiotoxicity caused by chemotherapy, not only anthracyclines

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Cancer is a complex disease which needs every available 'weapon' to defeat it. Chemotherapy and radiotherapy are very valuable techniques in this fight, but often they are also harmful for the body to such an extent that they can themselves cause irreversible damages. Heart disease induced by anticancer drugs is among these. Until recently, cardiotoxicity was considered related only to the use of anthracyclines (particularly adriamycin). In recent years, however, we have seen that almost all drugs used in chemotherapy, inhibitors of topo-isomerase, antimetabolites, alkylating agents and even monoclonal antibodies can cause serious and irreversible heart damage. Only in a few cases do we know the mechanism behind the toxicity. Only for a few drugs can we establish a relationship between cumulative dose, administration schedule and incidence of adverse cardiac events. In this scenario, it is important to recognise the leading role played by a cardiologist in the choice of remedies. Natural substances, especially phytotherapeutic elements, may be effective in treating and preventing damage induced by anticancer drugs, for example Resveratrol. These substances are thought to act on the cardiomyocytes, stabilise mitochondrial function, reduce reactive oxygen species (ROS) or have anti-inflammatory action through the inhibition of nuclear factor kappa B (NF- $\kappa$ B). Other supplements/drugs, of which the mechanisms are known, may be used. It may be worth considering that the practice of oncology can be complemented by other medical approaches. This integrative oncology can help to improve the quality of life for patients, reduce the irreversible damage and improve psychophysical wellbeing, important in a disease so critical and complex.

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### PP-112

#### Inappropriate prescription of several herbal remedies in a patient treated with anticancer drugs: a case of subarachnoid haemorrhage

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A 51-year-old woman suddenly developed severe headache and vomiting. At the emergency department, the patient also presented with disorientation to place and date, without side effects. The results of tests such as full blood count, erythrocyte sedimentation rate, prothrombin time, fibrinogen concentration, serum urea and electrolytes, as well as screening for autoimmune diseases (including those for LES), were normal. The patient was a non-smoker, with no history of hypertension, diabetes or vascular problems, neither did she have any relevant family history for neurologic illness or hypercoagulability. A computed tomography (CT) scan performed on emergency revealed a low-density area in the splenium of the corpus callosum and intraventricular haemorrhage. The electroencephalogram (EEG) was normal. The patient presented with a memory deficit and mild aphasia, but no functional motor deficit. Since 1 year she has been under treatment with Tamoxifene and Enantone for breast cancer, and recently used some herbal products and supplements comprising *Boswellia serrata*, Panax ginseng, *Viscum album*, bromelain, lactoferrin, melatonin and omega-3 fatty acids, as well as several vitamins and minerals. There are numerous reports in the literature suggesting that several supplements may affect coagulation. Dietary supplements could alter coagulation at various points in the cascade, particularly via platelet aggregation. The effects of some dietary supplements on the coagulation cascade may be due to their ability to lower arachidonic acid levels, responsible for their anti-inflammatory effect. However, natural products with anticoagulant/antiplatelet activity may increase bleeding, especially if used in combination with other substances with similar activities. Discussion of the case is focussed on dietary supplements that have been reported to alter haemostasis in humans, such as ginseng, *Boswellia*, melatonin, bromelain, beta-carotene, vitamins E, C and D and omega-3 fatty acids.

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**PP-113****A case of hepatotoxicity by *Pelargonium sidoides***

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*Pelargonium sidoides* (PS) is an African herbaceous, perennial plant in the geranium family. The root is the part used medicinally for respiratory problems. Its pharmacological activities include moderate direct antibacterial and antiviral potencies and immunomodulatory capabilities. An alcohol extract made from PS has become popular in Germany as a treatment for various respiratory problems, including acute bronchitis, common cold, sinusitis, pharyngitis and tonsillitis. The chemical composition of the PS is varied: sesquiterpenes are most abundant, coumarin and high quantity of tannins. In March 2011, a 46-year-old male patient was hospitalised. The patient suffered from epilepsy, oligophrenia, hypothyroidism, hypertension and a congenital heart disease. The patient had been on therapy with furosemide, acetylsalicylic acid, phenobarbital sodium, carbamazepine, olanzapine, valproate sodium, lansoprazole, allopurinol and canrenone for 10 years without any adverse effect. The blood tests performed about 15 days before hospital admission showed normal values (especially alanine transaminase (ALT), aspartate transaminase (AST) and bilirubin were in the normal range). Just before hospitalisation, the patient was treated with a remedy for a common cold: PS 30 drops three times a day, stopped after 6 days. In hospital the routine blood tests showed increased liver enzymes: ALT: 2385 IU I<sup>-1</sup> (normal range: 1–45) and AST: 4072 IU I<sup>-1</sup> (normal range: 1–36). After 3 days, blood tests showed a decrease of ALT: 1813 IU I<sup>-1</sup> and AST: 1251 IU I<sup>-1</sup>. The patient died on the 4th day due to acute liver failure and respiratory distress related to the above comorbidities. The case was defined as ‘possible’ according to the objective causality assessment performed using Naranjo algorithm. Adverse drug reactions (ADRs) related to PS are quite rare in the published clinical trials and, generally, they were of mild severity and comparable with a placebo. The most frequent ADRs reported, due to PS, were gastrointestinal disorders, nervous system disorders and ear and labyrinth disorders; however,

the presence of high concentrations of coumarins and tannins can cause liver toxicity. Recently, 15 cases of suspected hepatotoxicity induced by PS have been published, but they were evaluated as doubtful by the authors. This case underlines the importance of further studies to establish the association between PS and liver damage.

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**PP-114****Comparison of the effects of green tea and hawthorn extracts on endothelial function in isolated human mammary arteries**

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**Background and Aim:** This study was designed to determine the vasodilatory response of human internal mammary arteries (IMAs) to different concentrations of hawthorn (*Crataegus monogyna*) and green tea (*Camellia sinensis*) extracts and to compare it to the standard of the polyphenol present in the highest concentration in each extract as determined by high-performance liquid chromatography (HPLC).

**Methods:** Segments of IMA were harvested intra-operatively from 10 selected male patients undergoing coronary artery bypass grafting (CABG) (age range 48–68 years). The segments of IMA were cut into rings of 4 mm. The rings were suspended in 10-ml organ-bath chambers containing Krebs–Henseleit solution connected to a force transducer in the absence versus presence of whole extracts from hawthorn, green tea and standards of catechin and quercetin.

**Results:** Contraction (cN) was  $2.73 \pm 0.33$  compared to  $3.63 \pm 0.38$  ( $p=0.0015$ ) for *Crataegus* 200  $\mu\text{g ml}^{-1}$  and  $3.15 \pm 0.5$  compared to  $3.93 \pm 0.68$  ( $p=0.04$ ) for *Crataegus* 100  $\mu\text{g ml}^{-1}$ , while for quercetin 200  $\mu\text{g ml}^{-1}$  and 100  $\mu\text{g ml}^{-1}$  it was not significant (NS). For green tea 200  $\mu\text{g ml}^{-1}$  cN was  $2.85 \pm 0.63$  compared to  $3.84 \pm 0.79$  ( $p=0.03$ ), while for green tea 100  $\mu\text{g ml}^{-1}$  and catechin 200  $\mu\text{g ml}^{-1}$  and 100  $\mu\text{g ml}^{-1}$  it was NS. Endothelial-dependent relaxation to cumulative doses of acetylcholine 10<sup>-9</sup> to 10<sup>-4</sup> M expressed in Hill parameters was maximal for *Crataegus* 200  $\mu\text{g ml}^{-1}$ : maximum relax  $18 \pm 3.89\%$ , compared to  $5.16 \pm 1.16\%$ , EC<sub>50</sub> (-Log[M])  $7.6 \pm 0.17$  compared to  $7.4 \pm 0.19$  and Hill slope  $0.68 \pm 0.17$  compared to  $1.36 \pm 0.5$  ( $p < 0.0001$ ).

**Conclusion:** The study proved that whole extracts of hawthorn and green tea induced a more potent effect on contractile response and on endothelial-dependent relaxation of human IMA rings than the responses to the standards of main polyphenols in each of them. We emphasise that the synergistic interaction of polyphenols is essential for this response.

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