

## Frankincense and myrrh as remedies in children

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### Summary

Two cases of therapy with frankincense and myrrh in children are presented. The long history of this unusual treatment is outlined, demonstrating that for several millenia such agents have been employed in a number of medical contexts, as well as in the perfume and incense industries. Myrrh has found recent pharmacological application in the reduction of cholesterol and triglycerides, as predicted by several traditional therapies.

### Introduction

Five cases of therapy with frankincense and myrrh have been documented in Kingston, Jamaica and London's East End over the last two years. A case from each centre is presented.

### Case reports

*University Hospital, Kingston, Jamaica*

A 2-year-old child was admitted with severe malnutrition. A detailed history was difficult to elicit, as he had been cared for by a succession of friends and relatives. They had all noted his increasingly poor appetite over several months, accompanied by intermittent loose stools. A cough and respiratory distress, together with swelling of the feet had been observed for 2 days prior to admission. No medication had been given to him at the local clinic. On examination, the child was found to have kwashiorkor, and clinical evidence of a chest infection. He was treated with antibiotics and a refeeding regimen. His initial progress was slow; perhaps because of this his mother requested that she use some healing skin ointment and oral medicine she had purchased outside the hospital. She felt that these remedies would 'drive away the duppies' (spirits) that so obviously troubled her child. The medications were clearly labelled 'Frankincense and Myrrh'. On burning, they gave a sweet, resinous odour. His mother was reassured, and it was pointed out that the child was recovering steadily on standard medication. The boy was discharged well nourished six weeks later.

*Queen Elizabeth Hospital, Hackney, London*

A 3-year-old boy presented to casualty with a 2-week history of progressive respiratory distress. He initially had a fever and dry cough; he had developed tachypnoea, anorexia and vomiting in the days prior to admission. The parents had not used any medication, or taken the child to a general practitioner. Both parents were from the West Indies, and it appeared that the child had never been examined by a doctor in England. He had been delivered at home in Jamaica, as their first child. He had not received any vaccinations.

Examination demonstrated a well nourished, mildly distressed toddler with left-sided chest signs consistent with pneumonia. The child was admitted on intravenous fluids and antibiotics. During a more leisurely discussion with the parents on the ward, the father requested permission to give his son a 'home treatment' for cough. This consisted of a mixture of fine resinous granules, labelled 'Frankincense

and Myrrh', purchased from a West Indian traditional healer in London. The parents understood this to be a cough mixture, and not a spiritual remedy. The child's recovery was uneventful, and he was discharged home 7 days later, although the traditional therapy was not used on the ward. His clinical signs and chest X-ray changes resolved over 6 weeks. The cough mixture gave a sweet odour when burned, similar to samples of frankincense and myrrh.

### Discussion

Children are frequently treated with medications recommended by a traditional healer. Estimates of the prevalence of such 'fringe' therapeutics are not available in London, but a survey of inpatients conducted by the authors in Kingston demonstrated that at least 60% of parents had used herbal treatments for illnesses sufficiently severe to warrant hospital admission. A number of these medications, in particular those of a herbal nature, were derived from prescriptions in the older medical texts. It is curious that this particular prescription of frankincense and myrrh represents information transferred accurately through history: their application is one of man's oldest therapies. The coincidence of the same unusual therapy in two distinct socio-economic situations prompted this review.

### The resins

Frankincense and myrrh are resins collected from trees in Somalia and the Arabian peninsula. Prized by all civilizations, they once ranked along with gold, ivory, spices and textiles as valuables for trading and barter. Unique among these treasures, they are produced in a restricted geographical area, from uncultivated trees, collected by small nomadic groups<sup>1</sup>. Perhaps as a consequence of their limited supply, both substances are a source of considerable confusion from historical, linguistic and botanical viewpoints - it is uncertain how the majority of the sweet-smelling incenses described in the literature of Egypt, the Middle East and the Mediterranean basin correspond with those known today. The two solid resins obtained from trees were described most clearly by the surgeon and botanist Carter, in 1848.

Frankincense is a French word meaning 'pure incense' - the most pure and sweet incense. True frankincense resin is derived from two species of tree: *Boswellia carteri* (also called *B. sacra*) and *Boswellia frereana*. The *Boswellia* are low, spiky trees, found in the arid highlands of Somalia and the Arabian peninsula. Resin is gathered by making scrapes in the bark of the tree, and later collecting the exudate. Inferior qualities of frankincense are produced by other *Boswellia* species, and a resin known as West African frankincense or 'bumbo' is derived from the tree *Daniella thurifera*: not a relation of

true frankincense. This tree grows in Jamaica, and it is likely that the therapy described in the first case was collected from it.

Myrrh is a reddish oily resin, collected from the short, thorny tree *Commiphora myrrh*, belonging to the same family as the *Boswellia* species - the Burseraceae. It has a characteristically bitter taste: 'murr' is arabic for bitter. The *Commiphora myrrh* tree has a wider distribution across Somalia, Ethiopia, Kenya and the Arabian peninsula. There are a number of related *Commiphora* species producing resins, and other 'myrrhs' are described, such as the African myrrh from *C. habessinica*, or the guggulu resin from *C. mukul* (or *C. wightii*).

### History of the resin trade

It is likely that Egyptians came both by land and sea to collect these resins before 3000 years BC. Early Egyptian myth describes them as representing the 'tears of Horus' (son of Osiris and Isis)<sup>2</sup>. The most detailed record details the expedition of Queen Hatshepsut, sent to 'the Land of Punt' in approximately 1700 BC. Later texts of Greek, Roman and Indian origin describe the trade of these prized resins, which were exported to Rome, China and North Africa. The 'Incense Trade' swelled in 1100 BC with the domestication of the camel, facilitating transport across the desert lands of the Arabian peninsula.

### Applications of the resins

Earliest records of the use of both resins list applications both as incense and medicine. The Papyrus Ebers of circa 1500 BC is perhaps the oldest list of prescriptions; in it the priests who supervised funerals, mummification and cremations describe the value of both resins in each of these procedures, as well as in the treatment of wounds and skin sores. Between 25 and 35 AD Celsus recommended that frankincense be used to treat wounds, sources of bleeding, and as a possible antidote to hemlock<sup>3</sup>. If mixed with leek juice, it was thought to stop internal bleeding and superficial bruising. In the anonymous Syriac book of medicine (5th century) frankincense is indicated as useful in the treatment of catarrh, gout, colic and gastrointestinal haemorrhage. Avicenna's works of the 11th century contain numerous references to the use of frankincense in inflammation and infection of the urinary tract. In the 17th century Culpepper, a herbalist practising in the East End of London used frankincense to treat stomach ulcers and as a topical unguent for bruising<sup>4</sup>. During this period distillates of the resin, the 'oils of olibanum', were widely employed by the barber surgeons, apothecaries and alchemists, probably for their appealing scent<sup>5</sup>.

Other cultures used the resin and its oils in a similar way: in India frankincense was used on wounds and to treat rheumatism. In China it was a constituent of several skin remedies, including those for bruises and infected sores, and thus a treatment for leprosy<sup>6</sup>. In Kenya it was used for dressing wounds and, when mixed with sesame oil was taken to reduce the loss of blood in the urine from schistosomiasis infestation<sup>7</sup>. Today frankincense is used in the recipe of a commercial variety of Turkish delight, is widely employed as a component of perfumes and toiletries, and is added to a number of hair lacquers as a perfuming and hardening agent.

Myrrh has always had a wider application than frankincense as a medicine. It is described in early

Sumerian inscriptions detailing treatments for infected teeth and worms<sup>8</sup>. The Hippocratic writings (4th century BC) contain some 54 references to myrrh out of 131 descriptions of the use of incenses: it was the most popular component in the mixtures used in the treatment of wounds, sepsis and worms. Greek mythology describes how Myrrha, the beautiful daughter of the King of Cyprus, was dared by Aphrodite to secretly have a child by her own father<sup>9</sup>. Myrrha succeeded, but was changed by the gods into a myrrh tree to escape his revenge. The child, Adonis, became the darling of the earth and heavens. The symbolism of this legend may have much to do with the popularity of myrrh in early pharmacopoeias<sup>10</sup>. The Greek herbalist, Dioscorides, followed by Celsus and Pliny the Elder (23-79 AD) followed tradition and prescribed myrrh or its oils for infections of the mouth, teeth and eyes<sup>11</sup>. It was recommended for cough, particularly cough in children - one of the earlier specific paediatric prescriptions.

Myrrh's antibiotic effect had been successfully utilized before the first century BC to prevent the fermentation of wine to vinegar - a central challenge to the technology of the day. 'Aromatic' wines made using small amounts of myrrh were widely used<sup>12</sup>. In Hebrew tradition myrrh was often mixed with wine and given to a condemned man as an anaesthetic - Jesus was offered the mixture at the crucifixion<sup>13</sup>. Both Greeks and Romans thought myrrh efficacious in the treatment of snake bites (a belief still held in East Africa today<sup>14</sup>). This property led Andromachus, Nero's physician, to include myrrh in the first 'theriace', a compound medication which included 'vipers flesh' and opiates, designed to protect against poisoning. (The mixture was later referred to as 'Venice treacle'). The Romans had begun to use myrrh more extensively than the Greeks; it lost its mythological association and became a favourite term of endearment: 'my myrrh, my cinnamon' was perhaps equivalent to the American 'honey' of today. (The word 'myrrh' has given rise more recently to the forename 'Muriel'.)

An extensive description of the medicinal values of the Indian myrrh, known locally as guggulu, is found in Ayurvedic texts. In addition to prescribing guggulu for coughs and chest complaints, these records recommend that the resin be ingested for obesity to prolong life; old pieces of guggulu resin are prescribed as a slimming agent<sup>15</sup>. In China myrrh was used for a range of mouth and skin infections. Chinese authors, like the Ayurvedic healers, thought myrrh valuable in prolonging life and preventing chest pain in middle age.

Over the centuries myrrh has been widely prescribed to protect against plagues: in the Dioscoriad text, myrrh held in the mouth or chewed was only protective against halitosis. By the 10th century, both Arabic and European texts recommend this habit to all travelling through areas of epidemic infection. (It was later observed during the Great Plague of London (1665) that myrrh was not always very effective however!) In the Celtic 'leechdoms' myrrh is listed among the more unusual agents for the treatment of wounds and coughs, and for a variety of diseases in animals<sup>16</sup>. In these texts, the myrrh prescriptions are of Mediterranean origin, and it is thought that they may have been exchanged between Bishop Elias III of Jerusalem and King Alfred for church funds.

These documents suggest that myrrh may have been used in Britain as a medicine before it became popular as incense or a demonifuge in the church. Palaeopathologists have indicated that leprosy was prevalent in the Anglo-Saxon population, and therefore therapies for the skin manifestations of this disease were probably widely sought after. The earliest physical British record of myrrh is of its pollen, discovered in a small pestle in the ruins of an 11th century leper hospital in Scotland (Moffat B, personal communication).

In medieval times myrrh was further employed as an ingredient in many mixtures used to promote absorption, prevent nausea and diarrhoea, treat thrush or act as a tonic. It was an essential ingredient in Griffith's Mixture, the first iron compound used in the 18th century to treat patients after haemorrhage<sup>17</sup>. It was burned in the first hospitals in order to disperse the infective 'miasma'. Myrrh was used in large amounts by the English Navy in the 18th century, on the recommendation of the Royal College of Physicians, as a component of the 'Elixir of Vitriol' used on all ships to treat scurvy. The 'Elixir' doubtless had some healing properties, but it was not until the controlled therapeutic trial of surgeon James Lind that the merits of citrus fruit were demonstrated to the Naval administration, and with the introduction of a ration of lemon juice scurvy disappeared<sup>18</sup>. Used on its own, myrrh was believed to prevent early miscarriage, but it was combined with potassium iodide to make Utus paste, a topical mixture prescribed as an abortifacient<sup>19</sup>. Botanic herbalists such as the American Dr Coffin used myrrh as an enema as part of their treatment of cholera during the outbreaks of the early 19th century, and reportedly had more success with their therapy than the conventional practitioners. A myrrh and borax mixture was a popular Victorian toothpaste. Myrrh never appears to have been widely used in the Americas where its place in the therapeutic armoury was taken by resins from pine and spruce. Today myrrh remains in the French and British pharmacopoeias, and continues to be used in throat pastilles and cough mixtures, and as a suppository to treat proctitis.

Two principles may be proposed in order to elucidate the medical applications of these resins:

(1) The resins were used for logical reasons of association: for instance the observation that good smells drown out bad ones. In Theophrastus, 'aromata' referred to spices, incense and medicines together; such good smelling substances surely had healing powers<sup>20</sup>. This principle appears to have been further developed to the point that the resins may be used as demonifuges, or indeed to drive away infectious plagues. Anthropological evidence of similar patterns of the use of resins, incenses and sweet smelling substances in other cultures - an 'aromatherapy' - reinforces this suggestion<sup>21</sup>. A further association might have been that between a natural dressing for damaged trees, and a dressing for human wounds.

(2) The long experience of traditional healers would strongly suggest that there is a pharmacological value in the resins or their constituents. The parallel recognition of the value of myrrh as an antiseptic, antitussive, vermifuge and tonic, and of frankincense as haemostatic in several cultures further implies significant pharmacological activities.

Recent investigation of the resins supports the second principle. Both have measurable antiseptic,

antifungal and anti-inflammatory properties, and therefore make valuable wound dressings<sup>14</sup>. More striking still, the extensive examination of the myrrh resin from *C. mukul*, or guggulu has led to clear demonstrations that it has cholesterol and triglyceride lowering effects in humans. A 'guggulip' derivative has been marketed since 1987 in India for this purpose. This effect is independent of a mild thyroid stimulating activity observed in patients taking this preparation<sup>22,23</sup>. The resin is being put on trial in India as a slimming agent. There is therefore modern pharmacological proof supporting the suggestion made by the Ayurvedic and Chinese sources, both over 2000 years old, that myrrh might be efficacious in the treatment of a condition of middle age. Biochemical analysis of the resins demonstrates in addition a large number of components whose pharmacological activity is uncertain, and difficult to assay. For example, myrrh contains a number of flavonoids, derivatives of phenylbenzopyrone, which have been implicated recently in anti-inflammatory activities<sup>24</sup>.

### Conclusion

These cases and review emphasize the importance of taking a full paediatric history. Such a history is seldom possible at admission; because of suspicions of differing medical approaches, patients or their parents will frequently deny the use of traditional or alternative techniques. Our two cases illustrate the variety of beliefs held by those giving the remedies to the child. Little is known of the effects of the majority of such therapies, and because of the lack of quality control of their ingredients it may be difficult to measure the consequences with any accuracy in the individual patient. Contamination of traditional remedies has been widely reported, including a Chinese remedy employing myrrh, so the mixture itself should be collected if at all possible<sup>25</sup>. It is only by attentive collection of such histories that further progress may be made in this fascinating cornucopia. The tears of Horus continue to find application in today's therapeutic armoury, and may become items available in the local pharmacy.

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A fuller list of references may be obtained from the authors

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## Forthcoming events

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### 39th Session of the International Office of Documentation on Military Medicine: Management of Mass Burn Casualties

14-15 October 1991, Antwerp, Belgium

Further details from: Dr J Clement, Congress Reine - CTISM, Quartier Reine ASTRID, Bruynstraat, B-1120 Brussels, Belgium (Tel: 32 2 262 15 33; Fax: 32 2 268 72 49)

### Adhesion Molecules - Importance in Pathology, Diagnosis and Therapy

22-23 October 1991, The Cafe Royal, London

Further details from: Georgina Mason, IBC Technical Services Ltd, Bath House (3rd Floor), 56 Holborn Viaduct, London EC1A 2EX (Tel: 071 236 4080; Fax 071 489 0849)

### Gynaecology Oncology

23-24 October 1991, Manchester

Further details from: Postgraduate Education Department, The Royal College of Obstetricians and Gynaecologists, 27 Sussex Place, Regent's Park, London NW1 4RG (Tel: 071-262 5425, ext 207)

### Working for Patients

1 November 1991, The Royal Society, London

Further details from: Conference Department, The Royal Society of Health, 38A St George's Drive, London SW1V 4BH

### Extracranial Optic Nerve Decompression Meeting

2-3 November 1991, Boston, Massachusetts

Further details from: Michael P Joseph MD, Massachusetts Eye and Ear Infirmary, 243 Charles Street, Boston, MA 02114, USA (Tel: 617 573-3192)

### Success and Creativity in Drug Research

4-5 November 1991, Hotel Intercontinental

Further details from: (see entry for 22-23 October 1991)

### Delivery of Peptide Drugs

5-6 November 1991, Basel, Switzerland

Further details from: Programme Division, Technomic Publishing AG, Missionsstrasse 44 CH-4055 Basel, Switzerland (Tel: 061/43 52 26; Fax: 061/43 52 59)

### Diagnostic Testing

13 November 1991, Royal Pharmaceutical Society, London  
Further details from: Dr J A Clements, Room 403, Royal Pharmaceutical Society of Great Britain, 1 Lambeth High Street, London SE1 7JN (Tel: 071 735 9141 ext 289)

### Giornata Di Studi Ipnologici 1991

16 November 1991, Verona, Italy

Further details from: G Guatieri, Istituto 'H Bernheim', Via Valverde 65, 37122 Verona, Italy (Tel: 405/803795)

### Clinical Pharmaceutical Research: Acceptance of European Data in the United States

18-19 November 1991, Basel Switzerland

Further details from: (see entry for 5-6 November 1991)

### 7th International Symposium on Cardiopulmonary Urgencies and Emergencies

19-22 November 1991, Rotterdam, The Netherlands

Further details from: Dr O Prakash, Chief, Thorax Anesthesia, Thorax Centre, Dijzigt Hospital, Dr Molewaterplein 50, 3015 GD Rotterdam, The Netherlands (Tel: 31-10-463 5230; Fax: 31-10-463 5240)

### Paediatric and Adolescent Gynaecology

20 November 1991, Royal College of Obstetricians and Gynaecologists, London

Further details from: (see entry for 23-24 October 1991)

### Audit in Obstetrics and Gynaecology

21 November 1991, Royal College of Obstetricians and Gynaecologists, London

Further details from: (see entry for 23-24 October 1991)

### Accidents in the Home

26 November 1991, The Lansdowne Club, London

Further details from: (see entry for 1 November 1991)

### Risks, Dignity & Responsibility in Residential Homes

5 December 1991, The Lansdowne Club, London

Further details from: (see entry for 1 November 1991)

### 3rd International Conference on Drug Delivery and Targeting Systems: Prospects for the 90s

5-6 December 1991, Royal Lancaster Hotel, London

Further details from: (see entry for 22-23 October 1991)

### Techniques & Applications of Molecular Biology: A Course for Medical Practitioners

10-13 December 1991, University of Warwick

Further details from: Dr Rachel Strachan, Department of Biological Sciences, University of Warwick, Coventry CV4 7AL (Tel: 0203 523540)

continued on p 620