Some Aspects of the Practice of Pharmacy in Ancient Egypt 1850 B.C. to 1300 B.C.

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Abstract

The skills of the ancient Egyptians as physicians and surgeons is renowned and evidence abounds regarding the diseases and ailments which plagued the civilisation. What is less recognised is whether the ancient Egyptians practised pharmacy and what efficacy if any, lay in their medicaments. Over 1000 prescriptions from the Ancient Egyptian papyri, have been analysed their formulation, administration and efficacy compared with contemporary pharmacy. We have demonstrated that whilst pharmacists most probably did not exist as a separate profession in ancient Egypt, the art of pharmacy did. Indeed, some 70% of the known substances used by the ancient Egyptian physicians were in use some 3500 years later in 20th century A.D. The foundations established in Egypt were probably adopted by the Greeks whose political stability conferred historical continuity. Thus it was they, who were credited with being the fathers of medicine and pharmacy. Instigation and credit most probably lay with the Egyptians some 1500 years before Hippocrates.

Sources and methods

1. A data base of 1000 prescriptions within the Kahun (Griffith 1893 & Quirke 2002), Edwin Smith (Breasted 1930), Ebers (Ebbell 1937) and Chester Beatty (Jonckheere 1955) medical papyri has been compiled in the format of the British National Formulary and Martindale’s Extra Pharmacopoeia (1977).
2. The formulation, drugs, sources, extraction, preparation and administration have been detailed along with the part of plant or material used. Measurements were noted based upon the Ebbell system of notation (Ebbell 1937).
3. The efficacy of each prescription and its physiological action was compared with pharmacy in 20th century A.D.

Results and discussion

The method and preparation of formulations in ancient Egypt bear a striking resemblance to those of the 20th century AD, for the only real development lies in parenteral administration (Table 1). Their formulations, like ours, were characterised by the active ingredient, a vehicle in which it is conveyed, flavouring or an agent to make it soothing, and often a secondary drug to alleviate the adverse effects of the principal drug. Of their remedies, 72% were simple, only 28% demonstrating poly-pharmacy. They used techniques of concentration, dilution and solvent extraction, and were aware of dosing. Only 43 different methods of preparation were employed (Campbell 2003); each was specific, 90% reproducible. Moreover, they instructed that each remedy be dispensed and taken in a...
repetitive and reproducible format. Administration was oral, topical, rectal, vaginal, ocular, nasal, auricul, by inhalation or fumigation. Furthermore, they had a specified dose frequency and treatment regimen, drugs typically being taken for four or eight days. This period was significant there being no recrimination on the doctor if he deviated from the prescription after this time and he did so beforehand at his own peril (Aristotle: Politics 3:15). In addition to inorganic compounds, many of their drug sources were of food origin. That which sustained the body in health was used in potent amounts to influence the body in sickness (Tab. 3). Therapeutically laxatives dominated, principally; carob, aloes, castor oil, colocynth & debatably senna, as well as bulk laxatives of bran, figs and agar. Rectal administrations, as enemata and suppositories, were also used to medicate or soothe. Some were applied on lint; in others, the ingredients were ground and made into a suppository with a fat basis selected to melt at body temperature, thereby releasing the medicament. Calcium carbonate was used as an antacid and figs, barley, milk and honey were used as digestants. Anti-diarrhoeal remedies included carob starch and silphium. Diagnostically they had difficulty differentiating between the heart and stomach, but they prescribed aloes, mustard and willow (all

| Oral     | Topical    | Rectal    | Vaginal   | Ophthalmic | Nasal         | Auricular       |
|----------|------------|-----------|-----------|------------|---------------|-----------------|
| Draughts | Creams     | Enemata   | Douches   | Eye drops  | Drops         | Drops           |
| Electuary| Insufflations| Suppositories| Fumigation| Eye lotions| Inhalations Ointments|
| Extracts | Lotions    | Ointments | Pesaries  | Eye ointments| Powders      |
| Infusions| Ointments  | Paste     | Powders   | Spirits    |               |                 |
| Inhalations| Paste     |           | Powders   |            |               |                 |
| Linctuses| Poultices  |           | Powders   |            |               |                 |
| Mixtures | Powders    |           | Powders   |            |               |                 |
| Mouth washes | Solutions |           | Powders   |            |               |                 |
| Powders  | Spirits    |           | Powders   |            |               |                 |
| Pills    |            |           | Powders   |            |               |                 |
| Solutions|            |           | Powders   |            |               |                 |
| Tablets  |            |           | Powders   |            |               |                 |
| Syrups   |            |           | Powders   |            |               |                 |

Table 1 - Formulations compliant with the British National Formulary, used in Ancient Egypt.

| Drugs sources | Plants-common name | Inorganic | Animal |
|---------------|--------------------|-----------|--------|
| Absinthe      | Cumin              | Senna     | Ass    |
| Acacia        | Cyanus             | Selen     | Ass    |
| Aloe          | Dates              | Sylphium  | Cat    |
| Ammi          | Dill               | Sylphium  | Cat    |
| Aniseed       | Fig                | Sylphium  | Cat    |
| Asafoetida    | Flax               | Sylphium  | Cat    |
| Balanites     | Frankincense       | Tamarix   | Frog   |
| Balm          | Gallnut            | Thyme     | Gazelle|
| Barley        | Grapes             | Turpentine| Goat   |
| Bayberry      | Gum Ammoniac       | Wheat     | Goose  |
| Beans         | Hemp               | Willow    | Hedgehog|
| Benzoins      | Hyosycymus         | Yeast     | Human  |
| Bryony        | Incense            | Zizyphus  | Honey  |
| Cannabis      | Juniperus          | Lead      | Ibex   |
| Carob bean    | Ladanum            | Limestone | Lizard |
| Celery        | Lettuce            | Lye       | Mouse  |
| Cinnamon      | Lint               | Magnetite | Ostrich|
| Colocynth     | Lotus              | Malachite | Ox     |
| Coriander     | Manna              | Sasa Fruit| Pelican|
| Cress         | Morinker           | Sebesten  | Pig    |
| Cucumber      | Seed Wool          | Ochre     | Raven  |
| Orpiment      | Sheep              |           |        |
| Pumice        | Snake              |           |        |

Table 2
active glycosides), whilst the alkaloids in hyoscyamus, pomegranate and ammi are effective vasodilators. Their diuretics were honey, beer and carob or alternatively powdered dates and copious amounts of water to induce vomiting. Analgesics were restricted to carminatives of coriander and cumin & antispasmodics of hyoscyamus and aniseed to alleviate the symptoms of aggressive purgatives. Salt, alum and willow were effective antipyretics but there is no evidence of narcotics or sedatives until the Roman Period. Musculo-skeletal disorders were treated topically with warm bandages, rubefacients of turpentine, mustard, juniper and frankincense, whilst poultices were used to relieve pain or bring infection to a focus. Celery seed used by them for painful joints is currently being investigated for its anti rheumatic properties. Vaginal drugs were administered as douches, pessaries, ointments or fumigation to achieve intimate contact with the mucous membranes. It is unlikely they used absinth for menstrual regulation but to accelerate the onset of labour, they inserted a pessary of juniper oil, clinically recognised to induce uterine contraction. They expertly describe the parasitic worms which plagued them and with equal expertise prescribed anthelmintics of pomegranate, thyme, and antimony. Haematuria caused by schistosomiasis was treated with demulcent preparations based on barley water and acacia and fortuitously they also took antimony, an active biocide. Their antiseptics and germicides were efficacious. Their phenols were thymol and bitumen, their alcohols beer and fermented wine and their acids soured wine. They also used the heavy metals of zinc, antimony and copper as astringents mixed in any vehicle that would afford it even distribution. Coughs and respiratory diseases were treated with sedative mixtures based on honey or acacia or stimulants of antimony. For congestion they used a nasal wash of salt or inhaled the fumes of drugs using a hollow reed. It is probable that they used Ammi (khellin) to treat asthma much as we do today. Ophthalmic infections were treated with antiseptics of copper, honey, and child's urine, and they employed demulcents of acacia and milk. Drops or ointments were applied directly into the eye, the conjunctival sac, eyelid or margin. Where we once used mercury they used its close relative, antimony. Antiseptic malachite, honey and oil were put on lint and inserted in the ear for auricular infections, whilst warmed balanites oil was dropped in the ear to improve the hearing. Mouthwashes were of acacia, carob and milk, mixed with yellow ochre, cumin and copper, all of which were effective antiseptics and astringents. Acacia gum and plant mucilage were used as skin demulcents; balanites oil, castor oil and goose fat were used as emollients and, to control infection, they mixed them with salt, frankincense, malachite and ochre or lead and then bandaged them. The turpentine, copper, oils and honey they used for burns are still employed successfully by some African cultures today.
None of the medical papyri studied utilise weights and volume was used throughout for the measurement of drugs. This indicated the drug and vehicle, value, potency and above all, affords reproducibility. The unit of capacity was the heqat (4.8 litres);\( henu = \frac{1}{10} \text{heqat} \); the \( \text{ro} = \frac{1}{320} \text{heqat} \). Of the 1000 formulations examined the smallest quantity indicated is 0.5 \( \text{ro} \) (7.5 ml) the largest 80 \( \text{ro} \) (1200 ml); whilst there is some debate on the validity of the actual volume it is irrefutable that 23% of the prescriptions detail capacity and a further 45% can be estimated by precedent. Others were generally used topically or diluted in a vehicle to imply measurement is not critical. They specified the source of the drug, the part to be used, harvesting, preparation, extraction and administration. Doses were specific and adjusted for adult child or neonate.

**Conclusion**

Whilst pharmacists most probably did not exist as a separate profession in ancient Egypt, the art of pharmacy did. An ointment is detailed to be made by Chui the venerable, a high priest of Heliopolis (Ebell 1937). He did not have the title of pharmacist but in 1550 BC, he is recorded as having practiced the art some considerable time before. Twelve hundred years later an ostracan (BM 5634) records the absence of the preparer of medicines from work.

The foundations of Pharmacy established in the Old Kingdom were adopted by the developing Greek culture, particularly from 700 BC. Their subsequent political stability, domination and communication, conferred historical continuity. Thus it was the Greeks who were credited with being the “fathers of pharmacy” whereas, in reality, instigation and credit most probably lay with the ancient Egyptians.

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