

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

Jacqueline Campbell, Ann Rosalie David

K.N.H.Centre for Biomedical Egyptology, The University of Manchester, Faculty of Life Sciences, Stopford Building, Oxford Road, Manchester M13 9PT. United Kingdom.

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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

Introduction

The origins of medicine are classically attributed to Hippocrates (c.400B.C.) and those of pharmacy to Galenus, (130 A.D.). Indeed his legacy persists today in the use of 'galenicals' in pharmacy. The roots of medicine and pharmacy however, predate Hippocrates by 1500 years for evidence exists in the medical papyri that the ancient Egyptians were practising a recognisable form of pharmacy

in the Middle Kingdom and probably earlier. Caution must nevertheless be exercised in their interpretation. Discrepancies arise in the literal translation of symptoms, diagnosis and of plant and inorganic substances (Dawson 1935). Nevertheless, forensic evidence has conclusively determined many diseases which plagued the ancient civilization (David 1979, 1984), affording a basis for medical comparison. However, what is less recognized is whether (a) the ancient Egyptians treated their ailments; (b) they practiced pharmacy and (c) their medicaments had any efficacy.

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

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	Pessaries	Eye ointments	Powders	
Infusions	Ointments					
Inhalations	Pastes					
Linctuses	Poultices					
Mixtures	Powders					
Mouth washes	Solutions					
Powders	Spirits					
Pills						
Solutions						
Tablets						
Syrups						

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

Drugs sources	Plants-common name		Inorganic		Animal	
Absinthe	Cumin	Mustard	Senna	Alabaster	Ass	Tortoise
Acacia	Cyperus	Myrrh	Seyal	Alum	Bat	Wax
Aloe	Dates	Myrtle	Silphium	Antimony	Cat	
Ammi	Dill	Oil	Sory	Calamine	Crocodile	
Aniseed	Fig	Onion	Styrax	Clay	Dog	
Asafoetida	Flax	Papyrus	Sycamore	Copper	Dragon	
Balanites	Frankincense	Pignons	Tamarix	Dirt	Frog	
Balm	Gallnut	Pine tar	Thyme	Faience	Gazelle	
Barley	Grapes	Pistacia	Turpentine	Flint	Goat	
Baybury	Gum Ammoniac	Pomegranate	Wheat	Granite	Goose	
Beans	Hemp	Pond weed	Willow	Gypsum	Hedgehog	
Benzoin	Hyoscyamus	Potamogeten	Yeast	Ink powder	Human	
Bryony	Incense	Raisin	Zizyphus	Lapis lazuli	Honey	
Cannabis	Juniperus	Ricin		Lead	Ibex	
Carob bean	Ladanum	Rush nut	Limestone	Lizard		
Celery	Lettuce	Rushes	Lye	Mouse		
Cinnamon	Lint	Saffron	Magnetite	Ostrich		
Colocynth	Lotus	Sagapen	Malachite	Ox		
Coriander	Manna	Sasha Fruit	Natron	Pelican		
Cress	Moringer	Sebesten	Northern salt	Pig		
Cucumber	Seed Wool	Ochre	Raven			
Orpiment	Sheep					
Pumice	Snake					

Table 2

repetitive and reproducible format. Administration was oral, topical, rectal, vaginal, ocular, nasal, aural, 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, aloe, 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 sooth. 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 the stomach, but they prescribed aloe, mustard and willow (all

Oral	Topical	Inhaled
Ground fine, Chewed and swallowed	Boiled and bandaged	Gum placed in the nostril
Warmed to finger warmth, swallowed	Dusted	Inhale the smoke thro' reed
Ground, shaped into bread and eaten	Massage until well	
Warm every time, drink every day	Rub early in the morning	
Taken for four days	Apply to eye frequently	
Take twice daily for 14 days	Apply to eye lid	
Strained and taken	Grind in the morning; anoint at night	
Remains overnight in dew; taken for 4 days	Apply to the angles of the eyes	
Boiled taken before going to bed	Rubbed	
Take 10 ro for four days	Dress the part for four days	
Put in wine and drink immediately		
Rinse the mouth		
Rinse for 9 days		
Chew and spit out		
Rectal	Vaginal	E & E.N.T.
Injected into the hinder part	Pour over womb	Ground and put in eye
Boiled, applied to seed wool & put in hinder part	Fumigate the womb	Mix, put in eyes for 4 days
Make into a suppository and put in the hinder part	Sprinkle on womb	Instil into the eyes
Insert into the anus for four days	Anoint organ	Placed in the ear
Inject into the anus	Inject vulva	Infused in the ear
	Apply to genitals	
	Lint anointed, placed in vulva	

Table 3 - Administration & preparation.

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 absynth 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*, (4.8litres); *henu* = $1/10^{\text{th}}$ *heqat*; the *ro*, $1/320^{\text{th}}$ *heqat*. Of the 1000 formulations examined the smallest quantity indicated is 0.5 *ro* (7.5ml) the largest 80*ro* (1200ml); 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 ostracon (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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