HISTORY OF MEDICINE

# Mesopotamian medicine

**F P Retief, L Cilliers**

Although the Mesopotamian civilisation is as old as that of Egypt and might even have predated it, we know much less about Mesopotamian medicine, mainly because the cuneiform source material is less well researched. Medical healers existed from the middle of the 3rd millennium. In line with the strong theocratic state culture, healers were closely integrated with the powerful priestly fraternity, and were essentially of three main kinds: *barû* (seers) who were experts in divination, *âshipu* (exorcists), and *asû* (healing priests) who tended directly to the sick. All illness was accepted as sent by gods, demons and other evil spirits, either as retribution for sins or as malevolent visitations. Treatment revolved around identification of the offending supernatural power, appeasement of the angry gods, for example by offering amulets or incantations, exorcism of evil spirits, as well as a measure of empirical therapy aimed against certain recognised symptom complexes. Medical practice was rigidly codified, starting with Hammurabi's Code in the 18th century BC and persisting to the late 1st millennium BC. Works like the so-called *Diagnostic Handbook*, the *Assyrian Herbal* and *Prescription Texts* describe the rationale of Mesopotamian medicine, based predominantly on supernatural concepts, although rudimentary traces of empirical medicine are discernible. There is evidence that Egyptian medicine might have been influenced by Mesopotamian practices, but Greek rational medicine as it evolved in the 5th/4th centuries BC almost certainly had no significant Mesopotamian roots.

Although early Mesopotamian civilisation possibly predated that of Egypt, we know much less of the art of medicine in the 'Fertile Crescent' than in the Nile valley. This is largely because Mesopotamian literary sources are still grossly underexplored and underdeveloped.[1] The visiting Greek historian, Herodotus,[2] wrote in the 5th century BC that the Babylonians were without physicians or specialised medicine and that ill persons were taken to public places where passers-by were requested to advise on the nature of the illness and its treatment. In this overview it will be shown that the country did indeed have a system of medicine and healers, but that it was so different from the Egyptian and Greek medicine known to Herodotus that he did not recognise it as such.

## Historical overview

### Mesopotamian civilisation and empires[3-5]

Civilisation arose during the 4th millennium BC and revolved initially around a southern Sumerian culture that invented an ideogrammatic (cuneiform) script. A semi-nomadic Semitic people from the north (Akkadians) took over Sumeria to form a Sumero-Akkadian nation (2400 - 2000 BC), with Sumerian remaining the language of learning. Following on Elamite and Amorite invasions a Babylonian nation arose that lasted almost 1 000 years, characterised by cultural development under great kings like Hammurabi (1792 - 1750 BC). Kassite conquerors terminated the Babylonian era at the turn of the second millennium BC and introduced a bronze age characterised by relative cultural stagnation. The iron age Assyrians, a warlike Semitic nation, next came to power with Nineveh as capital (750 - 612 BC) and sacked Babylon. The last great Assyrian king, Ashurbanipal (669 - 629 BC), was an able ruler and scholar who assembled one of antiquity's greatest libraries, where Mesopotamian cuneiform literature written on clay tablets was collected.

In 612 BC Nineveh was destroyed by the Medes and Chaldeans who re-established a brief Babylonian empire (612 - 539 BC), which in turn was conquered by the new Persian Empire founded by Cyrus the Great. Under Achaemenian kings like Darius and Xerxes, the Persians ruled Mesopotamia and surrounding countries for two centuries until overrun by the Macedonian, Alexander the Great, in 331 BC. On the early death of Alexander in 323 BC his empire was divided into various sections, with the Mesopotamian region falling under a series of Seleucid kings. In 256 BC the native Parthians, later succeeded by Sassanian kings of Achaemenian stock, regained control and ruled the Persian nation until conquered by Islam in 642 AD.

### Medical sources

Our knowledge of Mesopotamian medicine is derived from records written in cuneiform script, mostly on clay tablets but

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occasionally engraved in stone. An example of the latter is the famous basalt stele of Hammurabi on which much of the medical practice of his time was codified. Deciphering and translation of cuneiform script was commenced by people like Sayce (1885) and Talqvist (1894), and continued inter alia by Küchler (1904), Ebeling (1921) and Thompson (1923). Some of the oldest tablets known were excavated at Ashur, and pre-date material found in Ashurbanipal's library of the 7th century BC. The latter collection, today stored in the British Museum, London, as the Kouyunjuk Collection, contains the bulk of tablets with Mesopotamian medical information known to science.[6] As this originally came from an Assyrian source, it has become common practice to refer to the study of Mesopotamian literature and culture as 'Assyriology'.

Our present understanding of Mesopotamian medical organisation, practice and theory is mainly derived from the following primary sources:

1. *Hammurabi's Code*[6,7] (18th century BC). The codified rule of medical conduct *inter alia* laid down acceptable medical fees for the first time in history. Retribution for injuries sustained because of medical treatment was outlined; compensation was influenced by social status, with least compensation for plebeians and slaves. Some regulations were quite Draconian, e.g. a healer causing death or blindness to a high-born person had his hands cut off. Healers did not work on certain days of the month, considered unlucky, and it was unethical to attend to hopeless cases. Also included were instructions for veterinarians, barbers, dental surgeons and wet nurses. In an epilogue, a terrible curse was invoked on anyone who dared to alter the code.

2. *Assyrian laws*[6] (early 1st millennium BC) also codified medical conduct and stipulated compensation as well as penalties for malpractice. Self-induced abortion was punished by impalation. The so-called *Assyrian Herbal*[6] represents a *materia medica* containing approximately 250 vegetable, 120 mineral and 180 animal-sourced medicines as compiled by Thompson (1924) from information on medical tablets in the Kouyunjuk Collection (British Museum).

3. Sigerist[6] refers to *Hittite medical codes*, which he considers the most humane in the ancient Middle East.

4. The *Diagnostic Texts*[7]*/Handbook*[8] (also referred to as the *Book of Prognoses*[6]) totalled 40 tablets/chapters and probably originated in the Kassite period (late second millennium BC). It is divided into five sections: (*i*) useful omens to be noticed on the way to the patient (2 tablets); (*ii*) visible symptoms relating to parts and organs of the body (12 tablets); (*iii*) prognoses determined according to daily progression of the illness (10 tablets); (*iv*) treatment and disease complexes, e.g. epilepsy (10 tablets, badly damaged and poorly decipherable); and (*v*) diseases of women and children, including pregnancy (6 tablets).

Some authorities describe 6 chapters, including a brief penultimate chapter on specific diseases.[8]

5. The earliest prescription texts[7] are from the end of the 3rd millennium BC and contain rational treatments, virtually devoid of spells and incantations. Written in Akkadian and Sumerian, treatment is usually (but not always) related to specific symptoms. There are also texts from the Kassite period, but the bulk is from Assyrian times (but clearly of Babylonian origin). In addition to oral medication, poultices and bathing in hot infusions are mentioned.

6. Among other less well-defined sources of medical information, Hussel[8] mentions a small tablet of late origin (possibly 400 BC) with a totally new approach, in which a list of diseases are attributed to four organs of origin, viz. the heart, stomach, lungs and kidneys.

Some royal letters from kings (like the Assyrian, Esarhaddon) to their staff contain interesting information on the medical profession.[6]

## Medical practice

As part of a theocratic state system Mesopotamian medicine was strongly based on religious and supernatural concepts. Herodotus claimed that Egyptian and Greek doctors were in demand at Persian courts.[9] Democedes and Ctesias were Greek doctors who served Persian kings.[10]

### Healers[6,7]

Healers existed from the 3rd millennium BC and gradually differentiated into three types: (*i*) *bârû* or seers, who were experts in divination – they interpreted omens, made diagnoses and set prognoses; (*ii*) *âshipu* or exorcists, who excelled in incantations used for expelling demons and reconciliation with the gods; and (*iii*) *asû*, physician-priests who treated the sick mostly with charms and drugs, but also operations. Of these three the *âshipu* were most influential.

Healers were much respected in society and belonged to the most educated classes. Training occurred in special schools attached to major temples and was of a confidential nature, not to be shared with outsiders. Most gods were considered to have some healing powers, but Ninib and Gula were specific healing deities. Ninazu was the lord of healers, and Ea, god of water, was also of importance.

Healers were stratified into ranks according to importance, and the chief healer was called *rabi asê*. In the Assyrian Empire royal healers took an oath of office, as did scribes, magicians, bird gazers and seers (related to the healing profession). Some healers were allowed to receive remuneration for their services from those patients who could afford to pay. Healers apparently wore special dress and tonsure (possibly a topknot).

### Basic concepts of disease

Medicine was dominated by the religious fraternity and priests played an important role.[4] All illness was seen as sent by gods, demons or other evil spirits. It was thus essential that gods and demons should be constantly appeased by proper

worship, feeding of the ghosts of ancestors with offerings, and wearing of appropriate amulets and charms. Taboos had to be recognised and respected.[6]

Illness was considered to be punishment for sins against the gods. But even in the absence of sins, illness could still be caused by evil spirits, who attacked for three main reasons.

1. So-called 'lack of caution'. This could be prevented by recognising and responding to omens in daily life, and using appropriate incantations.

2. Black magic sorcerers who could cast a spell, causing demons to enter the body.

3. It was thought that spiritual 'contagion' by a diseased person could facilitate the entry of an evil spirit; diseased persons were therefore considered unclean and had to be avoided. This concept fits in with the Semitic view expressed in Leviticus which prohibited contact with diseases like leprosy. Different gods and demons were thought to cause different diseases, and great attention was paid to omens (including stellar phenomena, dreams, watching the flickering of a newly lit flame or the spreading of a drop of oil on water, the presence of animals, or colours) to indicate cause and prognosis of illness. Right-sided objects were generally thought to have a better prognosis than those on the left, but this could be modified, for instance by the presence of animals, colours or other factors.[6,8]

There was no significant knowledge of anatomy or physiology, and human or animal dissection for scientific reasons was not performed. Great emphasis was placed on the value of reading the future in the entrails (extispicy) or liver (heptoscopy) of slaughtered sheep.[4,8] Dream interpretation was considered important in understanding disease.[11] Toothache was generally attributed to a tooth worm.[6]

Mesopotamian medicine was rigidly codified, allowing little room for discussion and adaptation over the course of time.[12] Medical practice therefore remained remarkably constant for millennia.

### Clinical practice

According to the *Diagnostic Texts* (above) it was customary for the healer (the *asû* in particular) to visit the patient's home in order to form an opinion on proper management. The healer noted significant omens on his way and in the sick room, but also paid attention to the patient's condition and symptoms, in systematic order from head to foot. Only male body parts are listed in the *Diagnostic Texts*. Disease complexes identified were generally vague and recognition was based predominantly on divination (omens, dreams, extispicy, etc.), but also on direct observation. Conditions like epilepsy, childhood diseases (and pregnancy) were recognised and addressed. The illness was observed daily, and a simple prognosis was developed.[6-8]Mesopotamian medical literature contains no clinical case descriptions typical of Hippocratic medicine.[12]

In making a diagnosis it was important to determine the exact demon responsible for the disease, and the reason why the demon had acted. This affected the prognosis directly.[6,8]

The prime aim of treatment[4,6] was to remove the demon or evil spirit responsible for the affliction, or to appease the angry gods. Having identified the cause through divination, an appropriate religious procedure would be instituted, incantations said, and amulets and charms worn. If present a demon would be exorcised by the *âshipu*. Witchcraft, when operative, would be destroyed by the ritual application of fire and water, and identified sorcerers dealt with severely. Additional therapy was often of quite an empirical nature and included a large variety of medicaments (the *Assyrian Herbal* and prescription texts have already been referred to), including fumigations, suppositories and enemas. There is no evidence of dietary treatment but use was made of massages, manipulation and therapeutic baths. Although there is no Mesopotamian treatise on surgical techniques, various surgical procedures (including dental work) were undoubtedly performed. According to Geller[13] venesection was probably introduced to Babylonia only in the late first millennium BC.

## Discussion

Compared with classical Greek rational medicine, Mesopotamian medicine was predominantly religious. However, for the average healer omens and divination were as 'rational' as the Hippocratic doctor's empirical principles.[8] Some rational elements are nevertheless to be found in Mesopotamian medicine,[6] as exemplified by some clinical descriptions in the *Diagnostic Texts* (the section on epilepsy is a good example),[14,15] therapeutic elements of their *materia medica* (e.g. the prescription texts from the 3rd millennium BC, mentioned above) and certain surgical procedures. Sigerist[6] points out that much of the basic psychosomatic approach of Mesopotamian medicine is indeed reflected in modern medicine. They recognised and reported the effects on health of factors like cold, alcoholic intoxication and unhygienic conditions.

It may be concluded that Babylonian medicine had a very minor direct influence on Hippocratic medicine, probably less so than Egyptian medicine. The only real impact would have occurred in pre-classical times through influence on early Cretan and Phoenician populations.[6,16] The rigid codification of Mesopotamian medicine also stood in stark contrast to Greek medicine which evolved through ongoing experimentation and discussion.[12]



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## CLINICAL IMAGES

# Unusual midline neck mass

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A 39-year-old woman presented to a day hospital with a midline neck mass that had been evident for 3 - 4 years. Clinically the patient was euthyroid.

Ultrasound showed a solid midline neck mass. Fine-needle aspiration cytology was performed, but was inconclusive and the patient was referred to a tertiary institution for further imaging.

A computed tomography (CT) scan of the neck revealed a well-circumscribed midline neck mass, anterior to the hyoid bone, with the same enhancement characteristics as normal thyroid. There was also a normal thyroid present (Figs 1a and 1b).

A 99m Tc-pertechnetate thyroid scan showed a normally located and functioning thyroid gland as well as midline ectopic thyroid tissue (Fig. 2).

Ectopic thyroid tissue may be encountered in the tongue, anywhere along the midline from the foramen caecum at the base of the tongue to the normal position of the thyroid, mediastinum, lateral neck and oral cavity.[1]

Prevalence of ectopic thyroid tissue is between 7% and 10% with lingual thyroid accounting for 90% of these cases.[2] Although very rare, the most common location for extralingual ectopic thyroid tissue, is the thyroglossal duct in the anterior

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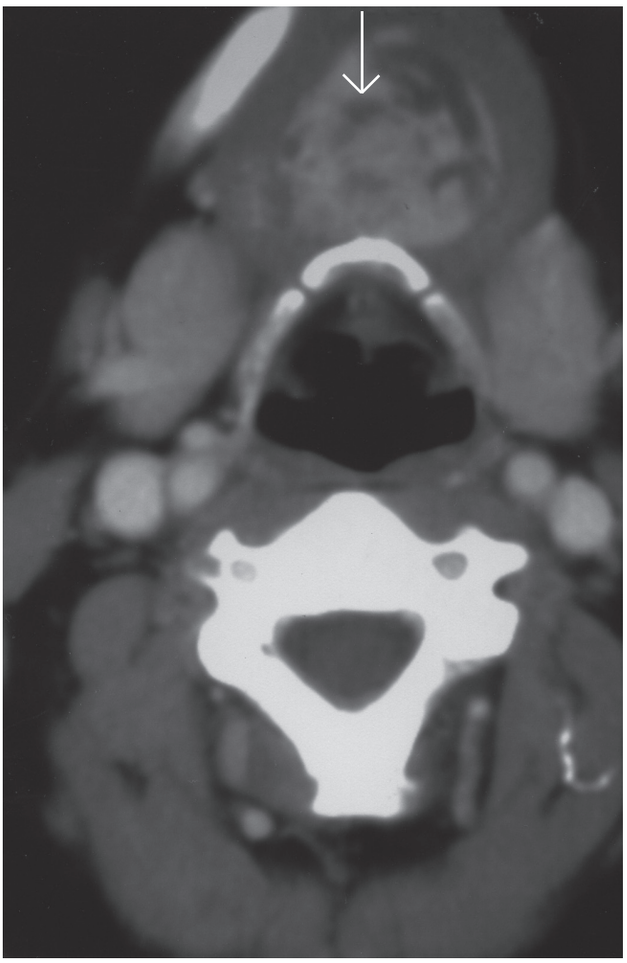

*Fig. 1a. Axial CT scan of the neck showed a well-circumscribed midline neck mass anterior to the hyoid bone with the same enhancement characteristics as normal thyroid (arrow – ectopic thyroid tissue).*

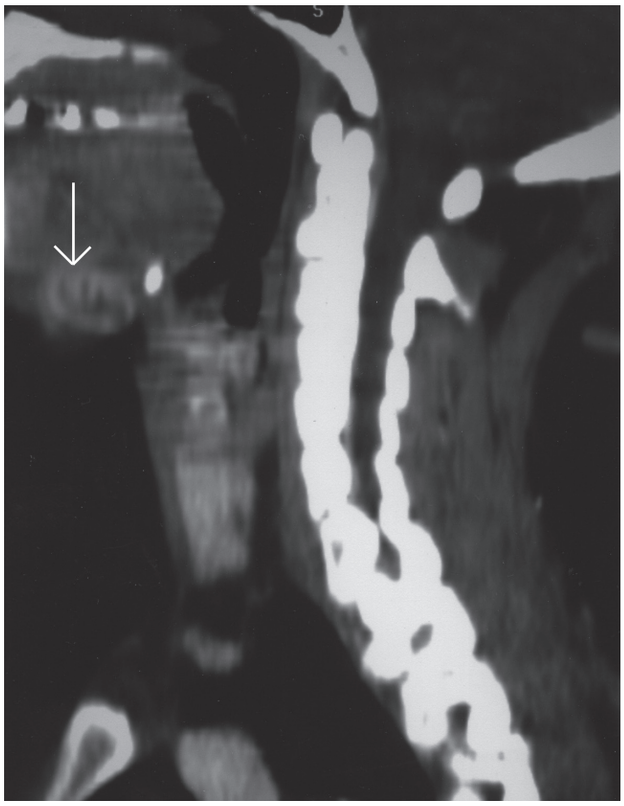

*Fig. 1b. Multiplanar reconstruction – sagittal reconstruction of midline neck mass (arrow – ectopic thyroid tissue).*

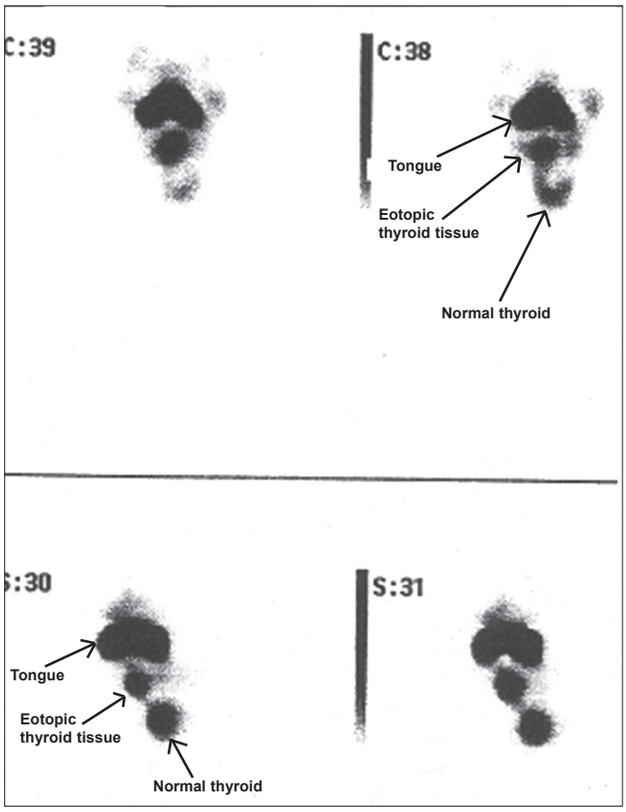


*Fig. 2. 99m Tc-pertechnetate thyroid scan showed a normal thyroid gland as well as midline ectopic thyroid tissue. Note normal uptake in the salivary glands, and increased uptake in the region of the tongue, the significance of which was uncertain.*

cervical area.[3] In 75% of cases this is the only functioning thyroid tissue.[4]

Preoperatively it is very important to demonstrate all functioning thyroid tissue via scintigraphy as a standard procedure so that the patient is not left hypothyroid postoperatively.[3,5]

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