Journal of Experimental and Clinical Medicine
https://dergipark.org.tr/omujecm

Research Article

J Exp Clin Med
2023; 40(2): 378-382
doi: 10.52142/omujecm.40.2.33

Peptic ulcer and its complications in Ancient Mesopotamian Cuneiform Texts

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Received: 25.03.2023 • **Accepted/Published Online:** 11.04.2023 • **Final Version:** 19.05.2023

Abstract

While the earliest known records on the digestive system were made by Hippocrates in 400 BC, the first description of peptic ulcer was made by Marcellus Donatus in 1586. However, when the cuneiform texts of Ancient Mesopotamia, which provide information on medical subjects, are examined, records of many diseases draw attention. Peptic ulcer is one of the important diseases that draws attention in the medical records of Ancient Mesopotamian societies, especially in the *Sakikku* series obtained from the Asurbanipal Library. This study is based on the information obtained by comparing the cuneiform documents with the current medical literature. The study aims to reveal that the findings of peptic ulcer disease were recorded earlier than Hippocrates. 10 of the 11 cuneiform texts analysed in this study provide information about epigastric pain, the most prominent symptom of peptic ulcer. Words meaning peptic ulcer are found in 6 texts (Sumerian A.GA.ZI 2, Akkadian *tugānu* 4) (54.5%). In 3 texts, death is stated as the prognosis if bloody vomiting continues. The term "gastroduodenal disease" in relation to the gastroduodenal resultant, where obstruction and bleeding are common, occurs in 5 texts. In 4 of them (*tugānu* 3, A.GA.ZI 1), peptic ulcer disease is mentioned (80%). In 4 texts in which "gastric outlet disease" and "peptic ulcer disease" are mentioned together, vomiting also accompanies the disease. Additionally, since the concrete symptoms of peptic ulcer could be identified, the cause of the disease was not attributed to abstract concepts such as the devil, evil spirit, and demon in the related texts.

Keywords: peptic ulcer, Ancient Mesopotamia, cuneiform, history of peptic ulcer, gastroenterology

1. Introduction

In Mesopotamia, located between the Euphrates and Tigris rivers, revolutionary developments emerged 6000 years ago. Many "firsts", especially in fields such as writing, law, urbanisation, and trade, have appeared in this region. Civilisations such as Sumer, Akkad, Babylon, and Assyria were founded in this area. The Sumerians invented writing, which marked the beginning of the historical period and the recording of humanity's verbal memory (1). Cuneiform texts containing medical records were also found as a result of excavations.

People have felt anxiety, fear, and anguish due to diseases they could not explain or overcome. In an effort to dispel the psychological effects of these diseases on people, they associated them with abstract concepts and rituals (2). These cuneiform medical documents contain abstract concepts such as evil spirits, devils, and demons. This is due to the close relationship between the polytheistic belief system that prevailed in ancient Mesopotamian societies and medicine. In this context, the priestly *āšipu*s, characterised as "white magicians" carried out activities in line with their duties after the training they received in the temples (3). From the texts, it can be determined that the *āšipu* were good observers and had important medical knowledge (4).

The *sakikku*, a continuation of the symptom-prognosis series, is a vital source of data on ancient Mesopotamian medicine that has survived to the present day. The *sakikku* series was written by Esagil-kin-apli, who lived in the Middle Assyrian Period and is described as the Hippocrates of the Ancient East. The series, dated to the beginning of the 1st millennium BC, consists of 40 cuneiform tablets containing approximately 3000 records and means "symptoms" (5, 6).

Around 1000 cuneiform tablets related to medicine were found in the library of Ashurbanipal (7). These documents were published in Assyrian Medical Texts (AMT) in 1923, Traité Akkadien de Diagnostics et Progostics Médicaux (TDP) by R. Labat in 1951, and Die Babylonishch-Assyrische Medizin (BAM) by F. Kocher in 1980 (8). Scurlock published the generally scattered medical documents by classifying them according to diseases and systems in 2005 and 2014 (7). Although there is information about peptic ulcers in these publications, no studies have evaluated them in light of current medical literature.

This study aims to show that the determinations of peptic ulcer disease were recorded in Ancient Mesopotamian texts long before Hippocrates.

2. Material and Methods

The main material evaluated within the scope of the study is

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the information obtained from 11 cuneiform tablets. The cuneiform texts were obtained from various sources, including The Sultantepe Tablets (STT), Assyrian Medical Texts (AMT), Die Babylonisch-Assyrische Medizin (BAM), The Diagnostic and Prognostic Series of Tablets (DPS), Traité Akkadien de Diagnostics et Pronostics Médicaux (TDP), and Scurlock (2005). The study was based on comparing the information in the cuneiform texts obtained from these sources and artifacts with current medical literature.

3. Results

Records of peptic ulcers have also been found in the cuneiform sources of Ancient Mesopotamia, which has ancient knowledge. In the cuneiform texts, the term "stomach" is mentioned as "TUN" in Sumerian and "*takāltum*" in Akkadian (9). Other words in the Sumerian dictionary that mean stomach, abdomen, and appetite are "MU-TUN, MU-TUN-NA" (9).

In the cuneiform texts providing information about Ancient Mesopotamian medicine, the general clinical findings of the patient are evaluated with an observant approach without mentioning the name of the disease. The texts conclude by commenting on the patient's prognosis after associating with the relevant god, evil spirit, or demon. However, the following text only contains symptoms and signs of the gastrointestinal system and does not include abstract concepts. The text states that the mouth of the stomach causes complaints of upper abdominal pain and echoing bitterness. "6.92 If the mouth of a person's stomach is sick (and) his upper abdomen (epigastrium) burns him, burns him hotly, stings him, and continually hurts him, ?? or DÚR.GIG, to cure him... (3,10)." The patient's condition was associated with the abstract concept in none of the 11 texts analysed.

Nowadays, the importance of dietary habits and food intake for peptic ulcer formation is recognised. In the following text, epigastric pain, mucus discharge, and loss of appetite are attributed to eating and drinking a substance called *kišpu*: "6.10 If his upper abdomen (epigastrium) continually has mucus, his epigastrium burns him hotly, he cannot sleep day or night, he loses his appetite for bread and water, (and) his flesh is tense, that person has eaten or drunk *kišpu*, to dispel it ... (3,11)." "Epigastric pain" was found in 10 out of 11 texts and was the most prominent symptom of peptic ulcer (Table 1).

In Mesopotamian medical texts, although the disease name is not mentioned in general, the words "A.GA.ZI" in Sumerian and "*tugānu*" in Akkadian in cuneiform texts are compatible with the clinical symptoms and findings of peptic ulcer disease (3). In the texts evaluated within the scope of the study, it was determined that the name of peptic ulcer disease was included in six texts, two of which were A.GA.ZI and four of which were *tugānu* expressions (Table 1). According to the current literature, upper abdominal pain and complaints of burning and pain are common symptoms of peptic ulcer (12). The word "A.GA.ZI" is mentioned in the text below with these symptoms. "6.97 [If] a person's [upper abdomen (epigastrium)?] ˹burns˺, [gives him a] ˹jabbing˺ pain, stings, and hurts him, that person is ˹sick˺ with A.[GA.ZI], to cure him (3,13)."

Table 1. Distribution of knowledge about peptic ulcer in cuneiform texts

Cuneiform text number	Epigastric burn	A.GA.ZI	Bloody Vomiting	Death Risk	Sick Mouth of Stomach	Tuganu	Vomits without Having Eaten	General semptoms *
6.10	+							+
6.97	+	+						
6.93	+		+	+				
6.94	+		+	+				
6.95	+		+	+				
6.103	+	+			+		sahhu +	
6.30	+				+	+	+	
6.98	+				+	+	+	
6.101					+	+	sahhu +	
6.99	+					+		
6.92	+				+			
Total (11)	10	2	3	3	5	4	4	1

*General Semptoms: Not appetite, sleeplessness, mucus

In the following texts, in addition to upper abdominal pain, intense or up to three days of bloody vomiting is considered to have a poor prognosis and may result in death (Table 1). In these texts, it can be seen that the *āšipu*s regarded persistent haemorrhagic vomiting in peptic ulcers as fatal. "6.93 If a burning pain is firmly established in his upper abdomen (epigastrium) and he continually produces dark blood, he will die (3,14). 6.94 If a needling pain or burning pain is firmly

established in his upper abdomen (epigastrium) and he excretes blood, he will die (3,14). 6.95 If a needling pain or burning pain is firmly established in his upper abdomen (epigastrium) and he vomits blood (and he has been sick) for two or three days, he will die (3,14)."

Bleeding, obstruction, and perforation, complications of peptic ulcer, are frequently observed in the region called the "gastric outlet" (12). The term "gastric outlet disease" is mentioned in five texts analysed in this study. In order to indicate the condition of peptic ulcer, the word "*tugānu*" is mentioned in three of these five texts, and the word "A.GA.ZI" is mentioned in one. However, the expression "gastric outlet disease" is also used (Table 1). One of these texts includes the following expression: "6.103 If a person eats bread and drinks beer and then continually produces saḫḫu, he incessantly vomits saḫḫu, he shows saḫḫu [and] black blood, he has constriction of the mouth of the stomach, and his upper abdomen (epigastrium) burns, burns hotly, stings, and hurts him, that person is sick with A.GA.ZI, to cure [him]..." (3,13). In addition, there are examples where the expressions "stomach outlet disease" or "stomach mouth disease" are used together with tugānu (stomach ulcer): "6.30 If *tugānu* (peptic ulcer; see below) afflicts a person, his upper abdomen (epigastrium) burns him hotly, (and) he vomits without having eaten (*gâšu*), that person has a sick mouth of the stomach, to cure him... (3,10). 6.98 If *tugānu* afflicts a person, his upper abdomen (epigastrium) burns him hotly, (and) he vomits without having eaten, that person has a sick mouth of the stomach, to cure him... (3,10). 6.101 If a person has *tugānu* (with) *saḫḫu*, that person has a sick mouth of the stomach, to cure him... (3,10)" exemplifies this situation.

It can be said that "gastric outlet disease" is seen as a complication of peptic ulcer in the texts. Additionally, texts 6.98 and 6.101 contain the terms nausea/vomiting, "*tugānu*", and "gastric outlet disease" together, while texts 6.101 and 6.103 contain the term "saḫḫu", meaning vomiting with a thick consistency (3). Thus, it is evident that all four texts in which the words *tugānu* or A.GA.ZI, which define peptic ulcer, are found together with the term "gastric outlet disease", include the symptom of vomiting. In these texts, vomiting probably occurred as a complication of gastric ulcer disease due to obstruction of the gastroduodenal resultant (gastric outlet disease).

Today, cholelithiasis is the first differential diagnosis for peptic ulcers due to the confusion of clinical symptoms. Peritonitis that develops due to the perforation of a gastric ulcer (*tugānu*) has symptoms of fever, vomiting with bile, and sharp pain in the upper abdomen (12). *Āšipu* naturally makes a differential diagnosis between *tugānu* (gastric ulcer) and *pašittu* (cholelithiasis), as seen in the following text: "6.99 If a person's upper abdomen (epigastrium) gnaws at them before they have eaten, they continually have internal fever, and when they belch, they vomit bile, that person is sick with *pašittu* (gall bladder disease) (or) *tugānu*, to cure him... (3,13)."

4. Discussion

The term ulcer refers to the loss of the mucous layer on the inner surface of hollow organs. In peptic ulcer disease, various organs, such as the distal oesophagus, stomach, and duodenum, may be affected. The most common form of peptic ulcer is the duodenal ulcer, frequently observed in the first 3-6 cm of the duodenum (15). Peptic ulcer develops histopathologically by the progression of defective erosions, deeper than 5 mm in diameter and smaller than 1 mm in diameter, on the gastric mucosa into deeper layers (16).

Gastric ulcer was historically first described by Marcellus Donatus in 1586. Through an examination performed on a patient who died acutely after intense sputum and vomiting, Donatus determined an ulcer in the pylorus part and the lower outlet hole of the stomach, leading to the patient's death. However, the first person to define peptic ulcer as a disease was Morgagni in 1737. A more detailed description of the symptoms and pathology of gastric ulcers was provided by Matthew Baillie in 1793. In 1817, Travers reported two cases of duodenal ulcer (17).

Apart from modern medical literature, there are also records from antiquity about gastric ulcers. According to Hippocrates, in 400 BC, the stomach's digestion process involves grinding and heating. On the other hand, Celsius recognised the presence of acid in the stomach in the 30s BC and recommended avoiding acidic foods if there was an ulcer in the stomach.

An inscription on one of the columns of the 4th century BC Temple of Aesculapius in Epidaurus, Greece, is believed to contain information about the first gastric ulcer surgery. The inscription reads, "A man with an ulcer in his stomach. He incubated and saw a vision; the god seemed to order his followers to seize and hold him, that he might incise his stomach. So he fled, but they caught and tied him to the doorknocker. Then Asklepios opened his stomach, cut out the ulcer, sewed him up again, and loosed his bonds. He went away whole, but the chamber was covered with his blood" (18).

However, the first definitive diagnosis of peptic ulcer disease could only be made in the 20th century. As a result of the autopsy examination of a mummy who died in 167 BC in China in 1975, it was determined that the person died due to disseminated intravascular coagulation (DIC), a disseminated coagulation disorder that developed after septic shock due to diffuse peritonitis resulting from perforation of the ulcer in the prepyloric region (18,19).

The general characteristic of cuneiform medical texts is evaluating the patient with an observant approach and listing symptoms and findings. At the end of the text, a prognosis is predicted by associating the patient's current condition with the evil spirit, god, or demon, which is thought to be the source of the related disease (6,7). However, this is not the case for the

cuneiform texts giving information about peptic ulcers in this study. This is probably because Ancient Mesopotamian healers had reached more concrete determinations about peptic ulcers.

Peptic ulcer disease is a common clinical condition observed symptomatically in approximately 10% of the population (12,20). It is unsurprising that peptic ulcer disease, frequently observed in today's society, was found in cuneiform texts belonging to Ancient Mesopotamian medicine, which has a history of thousands of years. Although it depends on many factors, especially dietary habits, the incidence of peptic ulcers in Ancient Mesopotamia is expected to be similar to today. However, we do not have the chance to learn these rates from texts.

The texts also described peptic ulcers and their fatal complications (7). Peptic ulcer haemorrhage is a very important complication despite the treatment methods developed today. Bleeding complications can be observed in half of the peptic ulcer patients, and 10% of the complications carry a risk of death (12). In Ancient Mesopotamia, where modern treatment methods were unavailable, bleeding likely had a mortal course. *Āšipu*s were concerned about the increased duration of peptic ulcer bleeding. The prolongation of the "bloody vomiting" symptom in the texts is associated with an increased expectation of death (Table 1).

"Gastroduodenal resultant" is the most common site of obstructions resulting from fibrosis of the ulcer (12). Before eradicating Helicobacter Pylori and current treatments such as antacids, 60% of peptic ulcer patients had gastric outlet obstruction complications (12). The fact that the words "*tugānu*" or "A.GA.ZI" were used together in four of the five texts analysed in this study shows the close relationship between "gastric outlet disease" and peptic ulcer (Table 1). The presence of these expressions, which require anatomical knowledge, in the texts suggests that the *Āšipu* knew the anatomy of the stomach and duodenum. However, autopsies are not yet known to have been performed in Ancient Mesopotamia. It is recorded that Hippocrates, Alkmeon, and Herophilos performed the first known autopsy in the 5th century BC (21). In our opinion, the presence of nausea and vomiting in cuneiform texts in which the expressions "A.GA.ZI" or "*tugānu*" and "gastric outlet disease" are mentioned should be considered obstructive symptoms. The addition of fever to gastrointestinal complaints indicates an infectious condition. Peritonitis caused by perforation of a peptic ulcer may be confused with the clinical picture of cholelithiasis. In text 6.99, the *Āšipu* seems to consider two important diseases related to these clinical presentations in the differential diagnosis.

In most texts related to peptic ulcer clinics, the Sumerian words "A.GA.ZI" and the Akkadian words "*tugānu*" were mentioned. Some of these texts also included clinical findings related to peptic ulcers. Epigastric pain and burning were the most prominent symptoms described in these texts. It was determined that complications of peptic ulcers, such as bleeding, obstruction, and perforation at the gastroduodenal resultant, were characterised as "gastric outlet disease" in cuneiform texts. Additionally, the texts stated that bloody vomiting associated with peptic ulcer bleeding is fatal if prolonged. Through research conducted for this study, it was determined that data on peptic ulcers was recorded in the cuneiform texts of Ancient Mesopotamia dating back to periods much earlier than Hippocrates.

Conflict of interest

The authors declared no conflict of interest.

Funding

No funding was used for the study.

Acknowledgments

This study is based on the master's thesis titled “The relationship of diseases in Ancient Mesopotamia with modern medicine (gastroenterology, neurology, psychiatry, infectious diseases)”, which was completed at Ondokuz Mayıs University, Institute of Graduate Studies, Department of History.

Authors’ contributions

Concept: B.D., Design: B.D., Data Collection or Processing: B.D., Analysis or Interpretation: B.D., Literature Search: B.D., Writing: B.D.

Ethical Statement

Ethics committee approval is not required fort his study.

References

1. Kramer SN. Tarih Sümer’de Başlar. 4th ed. Hamide Koyukan (trans.). İstanbul: Kabalcı Yayıncılık; 2021.

2. Bottéro J. Babil’de Sihir ve Tıp, Eski Yakındoğu Sümer’den Kutsal Kitap’a. Adnan K, Pınar G, Lale AÖ (trans.). Ankara: Dost Kitapevi; 2005.

3. Scurlock J, Andersen BR. Diagnoses in Assyrian and Babylonian Medicine. Ancient Sources, Translations, and Modern Medical Analyses. Urbana-Chicago: University of Illinois Press; 2005.

4. Kaçar A. Eski Mezopotomya'da Büyü ve Büyücülük. Doktora Tezi: T.C. Ankara Üniversitesi Sosyal Bilimler Enstitüsü Tarih (Eskiçağ Tarihi) Anabilim Dalı; 2020.

5. Mieroop MVD. Antik Yunan’dan Önce Felsefe. İstanbul: Ketebe Yayınları; 2020.

6. Erdem F. Eski Mezopotamya'da Kehanet Geleneği. Doktora Tezi; Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Tarih Anabilim Dalı; 2020.

7. Diri B. Eski Mezopotamya’daki Hastalıkların Modern Tıpla İlişkisi (Gastoenteroloji, Nöroloji, Psikiyatri, Enfeksiyon Hastalıkları). Yüksek Lisans Tezi: Ondokuz Mayıs Üniversitesi Sosyal Bilimler Enstitüsü Tarih Anabilim Dalı; 2022.

8. Wilson JK. Babil'de Hastalıklar: Örnek Metinlere Dayalı Bir İnceleme. Gökhan K (trans.). Tarih İncelemeleri Dergisi. 2008; XXIII(2): 261-274.

9. Aydın N. Büyük Sümerce Sözlük. Ankara: Türk Dil Kurumu Yayınları; 2013.

10. Gurney OR, Finkelstein JJ, The Sultantepe Tablets (STT), Occasional Publications of the British Institute of Archaeology at

Ankara 3 and 7. London: British Institute of Archaeology at Ankara; 1957, 1964. (STT 96:9-10; STT 96:5; STT 96:20-21;STT 96: 9-10).

11. Thompson, R. C. Assyrian Medical Texts from the Originals in the British Museum (AMT). London: Oxford University Press; 1923. (AMT 48/2:1-3).

12. Oviedo JA, Wolfe MM. Mide ve Duodenum Hastalıkları. Hatice K (trans.). In: Andreoli C, Charles CJ, Griggs RC, Benjamin IJ editors, Doç.Dr. Selçuk M (trans.). CECIL essentials of MEDICINE (Türkçe) 7'nci Edisyon, Ankara: Nobel Tıp Kitapevi; 2008, p. 390-405.

13. Kocher F. Die babylonisch-assyrische Medizin in Texten und Untersuchungen (BAM), Vol. 1-6. Berlin and New York: Walter de Gruyter; 1963-80. (BAM 75:l-2; BAM 578 ii 20-21; BAM 75:5-99).

14. Labat R. Traiti Akkadien de Diagnostic et de Pronostic Midicaux-2. Paris: Académie Internationale D'histoire des Sciences; 1952. (TDP 114: i 40 '; DPS XIII B i 36' - TDP 114: i 40 '; DPS XIIIB i 38'=TDP114 i 42'; DPS XIIIB i 39' =TDP 114i 43 ').

15. Yazıcı A. Peptik Ülser Hastalığı Değişiyor. Tıpta Uzmanlık Tezi: T.C İstanbul Üniversitesi Tıp Fakültesi Aile Hekimliği Anabilimdalı; 2008.

16. Kılıcarslan H, Kalyon S,Yenice N. Peptik Ülser Etyopatogenez. Okmeydanı Tıp Dergisi. 2013; 27(2): 65–69. https://doi.org/10.5222/otd.2011.065.

17. Ogilvie H, KBE, M Ch, FRCS. A Hundred Years of Gastric Surgery. 11 Temmuz 1947'de Atlantic City'deki Amerikan Tabipler Birliği'nin Yüzüncü Yıl Toplantısı'nda yapılan konuşmanın genişletilmiş versiyonu. 1947: 37-50.

18. Graham DY. History of Helicobacter pylori, duodenal ulcer, gastric ulcer and gastric cancer. World J Gastroenterol. 2014; 20(18): 5191–5204. https://doi.org/10.3748/wjg.v20.i18.5191.

19. Cheng TO. Glimpses of the past from the recently unearthed ancient corpses in China. Ann Intern Med. 1984; 101(5): 714–715. https://doi.org/10.7326/0003-4819-101-5-714

20. Göral PD. Günümüzde ve Gelecekte Peptik Ülser Tedavisi. Güncel Gastroenteroloji. 2003; 115-119.

21. Atan Y, Bahşi İ, Tataroğlu Z, Orhan M, Çetkin M. Dr. Charles Ambroise Bernard: Türkiyede Adli Otopsinin Başlangıcı. Adnan Menderes Üniversitesi Sağlık Bilimleri Fakültesi Dergisi, 2018; 2(3): 155-158.