

ORIGINAL ARTICLE

Problems and Injuries of Horse Larynx and Voice Based on Veterinary Texts of the Islamic Civilization Period

Abstract

In the lexicographic texts as well as in veterinary resources and specialized books on horses, the Islamic civilization period has focused on the types of sounds heard from horses; the concept of sounds has been explained as well. Exposure of horses to some infectious diseases affects their larynx in such a way that this consequently changes the animals' sound. Laryngeal problems in horses have been identified in ancient veterinary medicine by examining or hearing how the horse whines. The methods of identifying laryngeal problems and changes in the sound of the infected horses have been mentioned in ancient veterinary and specialized horse books in detail (*FARASNAMEH- BEITAREHNAMEH*, etc.). The purpose of this study was to conceptually obtain and classify the sounds of an infected horse followed by identifying its laryngeal problems that altered its natural sound.

This is a qualitative research article used to describe and document the analysis methods. Using the designed vocabulary keyword, references were searched in the veterinary, and some other medical literature resources, followed by employing various stages of content analysis method. Findings: Horses produce various sounds that include: *Hamhameh, Sahil, Wahvaheh, Rahraheh, Shakhir, Nakhir, Karir, Dhabh*, etc. For example, Sahil is divided in two: Salsaleh and Jaljaleh. For each of these voices, the meaning has been mentioned in the respective books. While infected, the animal's voice is altered due to damage to the larynx, a vital member of the horse's sound production. This impairs the horse's com-

Babak Abbasbeigi¹✉
Mostafa Moalemi²
Shahabeddin Sarvi³
Afshin Raofi⁴
Mohammad Reza Rajabnejad⁵
Hasan Siamian⁶

1- Ph.D., candidate of Medical History, School of Allied Medical Sciences, Mazandaran University of Medical Sciences, Sari, Iran

2- Ph.D., Assistant Professor of History of Medical Science, Department of Health Education, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

3- Ph.D., Associate Professor of Medical Parasitology, Department of Medical Parasitology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

4- Ph.D., Professor, Department of Internal Medicine, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

5- Ph.D., Assistant Professor of His-

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munication with the rider or trainer.

The findings showed that during the period of Islamic civilization, special attention was paid to horses. A variety of sounds produced by the animals were named, and their meanings were explained. Other unrelated Larynx problems also causing altered sounds due to laryngeal injuries were considered as independent illnesses, which they can be documented and read afterward.

In conclusion, this study provides a comprehensive description of the identification and interpretation of sounds produced by horses in the history of the Islamic era. Also, further research in this field can determine the capability of veterinary knowledge in the Islamic regions more than before.

Key words: Horses, Veterinary medicine, Larynx, Civilization, Islamic era

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Introduction

The throat area is the most critical upper path for the food, air passage and space for producing sound. There is a specific area in the throat called the larynx. The larynx is a short cartilage tube that connects the lower part of the pharynx to the trachea and plays a role in the production of sound. Generating sounds and any breathing noise are the result of air passing through a narrower space to a wider space¹. The vocal cords are located on the larynx and are the main voice producers located in the lower part of the pharynx and throat². In addition, there are valves in the animal's larynx that could be affected by larynx mucosa extrusion³. These valves are also considered to be important components of the respiratory and sound production apparatus⁴ and bounded by epiglottis in the front and pyramidal cartilage in the back⁵ of horse laryngeal valves with a mucous groove in the throat, connected through a wide hole called the Ventricle Laryngeal⁶. Vocal cords hang like a curtain through this hole, which partially closes the airway. Production of sound and neigh in horses are caused by frequent exacerbation of sacs and laryngeal ventricles⁷. The airflow angle from the animal's lungs to the larynx through the path has an impact on the vocal cords, causing various neigh sounds in horses⁸.

Statement of the problem

Any altered voice or neigh heard from a horse could be indicative of an event such as a reaction to something or someone, a symptom of a disease or health. Now, if individuals understand what these sounds mean or what has caused them,

tory of Medical Science, School of Persian Medicine, Iran University of Medical Sciences, Tehran, Iran

6- Ph.D., Associate Professor, Department of Health Information Technology, School of Allied Medical Sciences, Health Sciences Research center, Addiction Institute, Mazandaran University of Medical Sciences, Sari, Iran

Correspondence:

Babak Abbasbeigi
Ph.D., candidate of Medical History,
School of Allied Medical Sciences, Mazandaran University of Medical Sciences,
Sari, Iran

baabak.ab2000@gmail.com

- 1- Lindsay et al, 1986: 123.
- 2- Sack et al, 2003: 57-65.
- 3- Stomp et al, 2018: 7.
- 4- Ardalani et al, 2000: 5-10.
- 5- Sack et al, 2003: 57-65.
- 6- Attenburrow, 1980: 27-32.
- 7- Sack et al, 2003: 57-65.
- 8- Ibid.



they can treat the animal more accurately and effectively. The voice and neigh of the horses are differentiated and identified in modern veterinary medicine using radio stethoscopes, radiography techniques and the spectrogram software⁹. The main question of this study is how in the old veterinary, the diverse sounds of horses were differentiated and interpreted, how well the horse neighing was understood?

Method

This descriptive-documentary study, along with content analysis, was searched with the help of library tools, modern and old veterinary references (ancient veterinary books) with pre-defined keywords. The obtained data were categorized, and also the research findings were classified. The analysis conclusions were presented. The table in this article to differentiate (*al-Khail*) voice {Horse voice} was prepared based on the sources from the Islamic era for the first time. To the best knowledge of the researchers, so far, this has not been found in the modern and ancient veterinary medicine.

Results

In the veterinary textbooks of the Islamic world, *Ibn al-Baitar* may be regarded as a pioneer in the classification of sounds and neigh in horses.

In his book, he states (*Kamel al-Sina'atein fi Al-baitareh wa Al-zardagheh*) that there are five types of horse neigh and adds that besides these five sounds, other sounds from the throat and larynx are actually a combination of these sounds .

Different type of sounds¹⁰. (See Figure 1)

- **Sahil** – It is, in fact, the feeling induction of horse in a fight and against the rider.
- **Hamhammeh** – It sounds shorter than the *sahil*, coming from the throat.
- **Salsaleh** – It is a brief but strong rhythm sound of a horse's larynx.
- **Mohlalhal** – It is the true sound of the horse that best demonstrates *sahil*.
- **Al-ahash** – It is a harsh sound heard from the throat and nose of a horse¹¹.



Figure 1. Different types of sounds based on Ibn al-Baitar book

9- Ibid.

10- Ibn baitar, 1993: 107-117.

11- Ibid.



By studying and listening to a variety of sounds from the horse's larynx (referring to the ancient veterinary medicine and other references), we classified them more accurately and coherently, by separating and presenting virtually identical sounds in specific tables according to their interpretation and meaning. This classification first addresses the sounds that determine the animal's health and well-being. Then, in the diseases section, it discusses the diseases causing changes in the horse's laryngeal sounds.

Voices heard and recorded from healthy horse larynx in veterinary references (Islamic era) are classified in the following categories:

Different type of Neighs (See Figure 2)

- **Sahil** – It is a balanced rhythm which is said to be the larynx outlet^{12, 13}. It is also heard when the horse confronts a strong warrior¹⁴.

- **Sabaah** – It is the neigh of a horse made when confronting enemies¹⁵.

- **Saeer** /saʔr/ – It is a stronger neigh compared to *sahil*¹⁶.

- **Tahamhom** – It is the neigh shorter than *sahil*, associated with animal exhaustion¹⁷⁻¹⁹.

- **Jaljalah** – It is a smooth and rhythmic neigh sound^{20, 21}. A smooth neigh made when the horse is confronted by an enemy²².

- **Vahvahe** – This is a voice heard from the horse's throat and larynx after a *sahil* sound is heard²³⁻²⁶.

- **Mohalhel** – This is the most formal type of neigh²⁷.

- **Hamhameh** – This is a neigh made when the horse is hungry²⁸⁻³⁰.

- **Salsaleh** – This is a sound similar to *hamhameh* and *sahil*.³¹

- **Zafar** – This is a neigh associated with strong exhilaration³² (a kind of *Tahamhom*)³³.

- **Shahigh** – This is a neigh associated with exhalation³⁴.

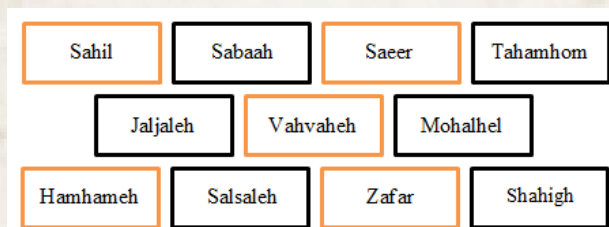


Figure 2. Various types of neigh

- 12- al-Damiri, 2003: 12.
- 13- Ibn Qayyam, 2016: 54-69.
- 14- Ibn Duraid, 1987, Vol. 3: 35.
- 15- Ibn Qayyam, 2016: 54-65.
- 16- Ibn Qayyam, 2016: 54-69.
- 17- Ibn Qayyam, 2016: 43.
- 18- Khalaf Tabrizi, 2012, Vol. 1: 325.
- 19- Ibn Qutaybah, 889: 33.
- 20- Ibn Qayyam, 2016: 54-69.
- 21- Rampori, 1995: 33.
- 22- Yosuf Shah, 2005: 412.
- 23- Khalaf Tabrizi, 2012, Vol. 1: 325.
- 24- Ibn Qutaybah, 889: 33.
- 25- Rampori, 1995: 68.
- 26- Safipoor Shirazi, 2009, Vol. 4: 42.
- 27- Ibn Qayyam, 2016: 58.
- 28- Ibn Qayyam, 2016: 63.
- 29- Safipoor Shirazi, 2009, Vol. 4: 61.
- 30- Ghalghashandi, 1982: 450-453.
- 31- Ibn Qayyam, 2016: 59.
- 32- Ibn Qayyam, 2016: 62.
- 33- Malooff, 1908, Vol. 1: 95.
- 34- Ibn Qayyam, 2016: 62.



The voices indicating excitement and/or turmoil in horses

• **Al-khanghaghigh** – This shows the horse’s anxiety when confronting an enemy^{35, 36}.

• **Al-Sadīh** – This is the horror neigh of horses that are feared³⁷.

The sharp sounds coming out of the horse’s throat and larynx (See Figure 3)

• **Al-Hazam** – This is the sound of a horse’s larynx like a thunder³⁸.

• **Dhabh** /ḍabḥ/ – It is the sound of horses roaring against enemies^{39, 40}.

• **Al-sadīh** – This shows a fierce horse that is terrified⁴¹.



Figure 3. The sharp sound of Throat and Larynx

The sounds coming out of the horse’s throat and larynx while running (See Figure 4)

• **Al-Karir** – This is a neigh that comes from the bottom of the chest. This neigh is heard a lot in horses while running strangely⁴².

• **Ehtezam** – This shows a fierce horse the sound of a horse’s breathing heard from the larynx while running slowly⁴³.

• **Al-Khavayah** – The sound comes out of the female horse’s larynx when it starts to move⁴⁴.

• **Al-Vaagh/Vaāgh/ (or) Al-vaigh/VaĪgh/** – This shows the early breaths of a female horse (mare) when it begins to move^{45, 46}.

• **Al-Khaqigh** – This shows the early breaths of a male horse (stallion) beginning to move^{47, 48}.

• **Al-Hataat** – This is the sound of an agile horse breath when walking fast (the sound is due to the horse’s rapid and uniform breathing⁴⁹).

The sound of a healthy horse’s nose from the throat and larynx

• **Nakhir** (or) **Khava/Khavā/** – This is a throat-like sound caused by the opening and closing of the nose⁵⁰. The equivalent of this voice in veterinary medicine is named “squeal”^{51, 52}.

• **Al-Jashash** – This is the sound of the horse’s nose blades (when exhale wraps in it)⁵³. The equivalent of what new vet-

35- Ibn Qayyam, 2016: 55.
 36- Ibn Duraid, 1987, Vol. 3: 38.
 37- Ghalghashandi, 1982: 452.
 38- al-Bakhshi, 2009: 38.
 39- Asgari, 1993: 524.
 40- Fakhr Modaber, 1967: 116-130.
 41- Ghalghashandi, 1982: 453.
 42- Ibn Qayyam, 2016: 66.
 43- al-Bakhshi, 2009: 14.
 44- Ghalghashandi, 1982: 450-453.
 45- Ibn Qutaybah, 889: 32.
 46- al-Bakhshi, 2009: 103.
 47- Ghalghashandi, 1982: 452.
 48- Malooff, 1908, Vol. 1: 48.
 49- Yosuf Shah, 2005: 43.
 50- Asgari, 1993: 522.
 51- Lindsay et al, 1986 : 123.
 52- Bonnie, 2018: 43.
 53- Ibn Qayyam, 2016: 58.



erinarian is called “Snort”^{54, 55}.

- ***Al-Ghabe***/ghabʕ/ – The sound which is generally heard after the horse neighs from the nose^{56, 57}.



Figure 4. The sound coming out of throat while running

Different sounds heard from the throat of a horse

- ***Gharashat*** – This, also called the restlessness sound, is the sound of a horse’s throat due to restlessness in an invasion or a war^{58, 59}.

- ***Al-Zamzamah*** – This is a sound that comes out of the throat of an animal while it is in peace⁶⁰. The equivalent is “*Nickler*” in modern veterinary medicine⁶¹.

- ***Al-Qobqobah***/ghobghobeh/ – This is the sound of a horse’s belly heard from the mouth (cries of the abdomen)^{62, 63}. This is heard from the horse during the horse-mashing⁶⁴. The equivalent to modern veterinary is “*Sigh*”^{65, 66}.

Noted below, from the veterinary history textbooks of horses, are some pharynx and larynx diseases that can cause major changes in the sound and tone of the animal.

Some Problems and Diseases of the Horse Larynx (Listed in Islamic era) (See Table 1)

- ***Khalad Disease*** – It appears in the horse’s larynx and causes yellow lesion with yellow pus^{67, 68}. This wound can pierce the larynx and leads to the death of the animal⁶⁹. In this condition, a sharp sound is heard from the horse’s larynx^{70, 71}.

- ***Salsaal***/ṣalṣāl/ – It is a sharp sound coming from the horse’s larynx⁷². Ancient veterinary literature has indicated that during the battle, horse riders partially cured this disease

54- Bonnie, 2018: 44.
 55- Nickel et al, 1979: 236.
 56- Ibn Qutaybah, 889: 32.
 57- Safipoor Shirazi, 2009, Vol. 4: 230.
 58- al-Khori, 2006, Vol. 5: 135.
 59- Malooff, 1908, Vol. 2: 628.
 60- Ibn Qayyam, 2016: 66.
 61- Bonnie, 2018: 44.
 62- Ibn Qayyam, 2016: 61.
 63- Ibn Duraid, 1987, Vol. 3: 33.
 64- Bullor, 2013: 411-413.
 65- Sack et al, 2003: 57-65.
 66- Bonnie, 2018: 45.
 67- al-Bakhshi, 2009: 49.
 68- Ibn baitar, 1993: 112.
 69- al-Bakhshi, 2009: 101.
 70- Ibn Qayyam, 2016: 69.
 71- al-Bakhshi, 2009: 46.
 72- Ibn Qayyam, 2016: 63.



by placing hot sword on the infected region (*Al-kay method*)^{73, 74}.

Table 1: Horse larynx diseases and problems in Islamic era

Name	Ref.	Name	Ref.	Name	Ref.	Name	Ref.	Name	Ref.
<i>Khalad</i>	al-Bakhshi	<i>al-Hashraqah</i>	Asgari	<i>Saal</i>	al-Bakhshi	<i>Al-Khavveh</i>	al-Malooof	<i>Zers Al-fozool</i>	al-Damiri
<i>Salsaal</i>	Ibn-Baitar	<i>Qohb</i>	Safipoor	<i>Al-Hash</i>	al-Damiri	<i>Zabeh</i>	al-Damiri	<i>Shagh Al-hae</i>	Ibn-Qayyam
<i>Seghaveh</i>	Ibn-Qayyam	<i>Khanzair</i>	Asgari	<i>Al-najim</i>	Khalaf	<i>Varan Al hae</i>	Ibn-Qayyam	<i>Jashash</i>	Ibn_Baitar
<i>Nahr</i>	Ibn-Qayyam	<i>Shakir</i>	Ibn-Qutaybah	<i>Da al-ankubot</i>	Asgari	<i>Alagh</i>	al-Bakhshi	<i>Naib</i>	al-Damiri
<i>Nolme</i>	Ibn-Qayyam	<i>Khavangh</i>	Ibn-Baitar	<i>Ghyasheh</i>	al-Damiri	<i>Eghas</i>	Ibn_Qayyam		

73- Asgari,1993: 523.
 74- Fakhr Modaber, 1967: 121.
 75- Bonnie, 2018: 45.
 76- Lindsay et al, 1986: 123.
 77- Bonnie, 2018: 44.
 78- Ibn Qayyam, 2016: 64.
 79- al-Bakhshi, 2009: 61.

In modern veterinary medicine, the disease can be similar to that of strangles *Gurum* or *Ketto*, which is caused by *Streptococcus Equi = S.Equi*⁷⁵. The disease occurs in the animal's larynx and causes acute inflammation of the upper respiratory tract. However, its reactions in the animal's throat and larynx are very specific⁷⁶. The larynx is the part of the throat often called the "voice box" in humans. It is located near the top of the trachea. The larynx is composed of muscles and cartilage, and it includes the vocal cords. Several disorders of the larynx are seen in horses⁷⁷.

• **Seghaveh disease** – It is divided into two types (cold and hot):

a) **Cold seghaveh** – This causes a hard swelling of the larynx that prevents the animal from eating and the infection spreads to the animal's nose^{78, 79}.

b) **Hot seghaveh** – This causes a soft swelling of the



larynx. When the horse moves and runs, the infectious material is discharged from the nose and mouth of the animal^{80, 81}. This disease causes hoarseness sound (*Naht* and *nohmeh*), heard from the horse's larynx^{82, 83}.

- **Naht** – This is a sound that goes from the chest to the pharynx. In horses, this sound indicates pain and helplessness. This sound in modern veterinary medicine is called Groan (= *Grunt*). In wild female horses, this sound is similar to *Scream*⁸⁴⁻⁸⁶.

- **Nohmeh** – It is heard in hot *seghaveh* cases^{87, 88}.

- **Al-nohmeh** – This is the sound of a cough produced from the throat and larynx of a horse⁸⁹.

- **Khavanigh disease** – This is a sore throat and laryngitis that prevents animal from swallowing food^{90, 91}. Pain and swelling of the throat and larynx that prevent the animal from swallowing food⁹².

- **Shakhir** – Unlike *hot seghaveh*, this disease produces throat noise in the horse's throat⁹³. The sound is heard from the horse's throat and larynx when the animal's nose is swollen^{94, 95}. The equivalent of this sound in modern veterinary medicine is blow⁹⁶:

- **Khanaazir** – This is also called laryngeal tuberculosis (*Tuberculosis* in the larynx). This condition is most commonly seen in the young horses (*Mahaareh*), the horses with softer muscles⁹⁷. *Khanaazir* is also found in the skin and vessels⁹⁸.

- Qohaab and Nohmeh** – These sounds are abundantly heard from horse throats^{99, 100}. **QOHB**=Qohab/ghohāb/ – This is the sound of coughing horse¹⁰¹.

- Al-HashraJah (or) Death breath – At the final stages of life, the sound will be the last breath of the animal^{102, 103}.

- Al-Hasharaja – This is the voice of the throat of a horse at the time of death¹⁰⁴⁻¹⁰⁶.

- Soaal – It is a kind of cough.

There are 3 major soaals in horses:

A) Wound Cough -B) Cold caused -C) Dust-induced and allergic.

A. **Wound Cough**: It is due to inappropriate handling and digestive problems of horse and causes *Al-Hash* sound in the animal¹⁰⁷.

- Al-Hash/al-haš/** – This is a harsh sound heard from a horse's throat and is caused by a horse's larynx illness.

B. **Cold-induced cough**: In cold areas or if a sudden change in the animal's body temperature occurs, the animal produces *Najim* sound in the throat^{108, 109}.

80- Ibn Qayyam, 2016: 63.

81- al-Bakhshi, 2009: 59.

82- Ibn Duraid, 1987, Vol. 2: 48.

83- Ibn Qutaybah, 889: 23.

84- Sack et al, 2003: 57-65.

85- Nickel et al, 1979: 236.

86- Bonnie, 2018: 44.

87- Ibn Qayyam, 2016: 76.

88- al-Bakhshi, 2009: 173.

89- Malooff, 1908, Vol. 2: 125.

90- Ibn Qayyam, 2016: 76.

91- Ibn baitar, 1993: 117.

92- al-Bakhshi, 2009: 54.

93- Ibn Qayyam, 2016: 58.

94- Ibn Qutaybah, 889: 36.

95- Rampori, 1995: 33.

96- Bonnie, 2018: 44.

97- Asgari, 1993: 524.

98- Bonnie, 2018: 45.

99- Safipoor Shirazi, 2009, Vol. 4: 137.

100- Malooff, 1908, Vol. 2: 148.

101- Safipoor Shirazi, 2009, Vol. 4: 138.

102- Asgari, 1993: 521.

103- al-Bakhshi, 2009: 52.

104- Ibn Qayyam, 2016: 101.

105- Asgari, 1993: 523.

106- al-Zamakhshari, 2013: 29.

107- Ibn Qayyam, 2016: 61.

108- Ibn Sidah, 1999: 156.

109- Ibn baitar, 1993: 113.



i. **Al-najim** – The word literally means “new born plant”^{110, 111}, but in the field of veterinary phonology, it is a whistle sound coming out of the horse’s chest toward the horse’s larynx¹¹²⁻¹¹⁴.

C. **Dust and allergy**: Most commonly, this occurs in the daytime, with coughing, white discharge coming out of the horse’s mouth, causing *nahmeh*, *najim* and *qhohab* sound in the horse’s throat^{115, 116}.

i. **Da al-Ankubot** – This is the swelling of the outer nose of the horse (*Khayashim*)^{117, 118}, accompanied by an outbreak of nasal infection. This infection and swelling can continue until the throat is clogged¹¹⁹. *Da al-Ankubot* makes a sound of *shakhir* in the throat¹²⁰.

ii. **Ghiyasheh** – This disease occurs in the nose of the animal while the discharged blood and pus block breathing^{121, 122}. The *Shakhir* voice is sometimes heard^{123, 124}.

The difference between the Ghiyasheh and Dai al-Ankubot

It swells the entire animal nose uniformly, but in the bowel, swelling occurs regionally and in different parts of the nose¹²⁵⁻¹²⁷. In modern veterinary medicine, equivalent to *Ghiyasheh* disease is COPD (*Chronic Obstructive Pulmonary Disease*)^{128, 129}.

• **Eghas disease**: This is an intra-nasal ulcer that causes infection in the pharynx, larynx, and even the eyes of the animal^{130, 131}. A *salsaal* sound is heard when the pus reaches the larynx^{132, 133}.

• **Alagh mode**: A *Najim* sound is heard in the event that a leech or worm enters the animal’s pharynx and respiratory tract, making it difficult for the horse to breathe^{134, 135}.

• **Varam Al-Hae**: This is due to the presence of swelling in the upper part of the larynx, which makes it difficult for the animal to open its mouth¹³⁶. It affects the horse’s voice and creates the sound of *Al-Jab*¹³⁷. *Al-Jab* is the Anxious horse neigh^{138, 139}.

Zabeha disease is also referred to as *khonagh*^{140, 141}. *Zabeha* is generally seen in the pharynx and larynx of the animal and can be associated with the *Ghiyasheh* state¹⁴². At the same time, *shakhir* and *al-jab* sounds are heard in the horse^{143, 144}. Equivalent to this disease in modern veterinary is *CROPS*¹⁴⁵.

• **Zaebah/daeba/**: This is a severe swelling in the lung that develops in the horse’s chest due to a severe leg injury¹⁴⁶⁻¹⁴⁸. In this case, the combined *Al-Khavayeh* and *Al-Naht* sounds from the horse’s larynx is heard, an indication of the pain and

- 110- Khalaf Tabrizi, 2012, Vol. 4: 243.
 111- Nafisi, 1964: 220.
 112- Bullor, 2013: 413.
 113- Sack et al, 2003: 57-65.
 114- Bonnie, 2018: 44.
 115- Safipoor Shirazi, 2009, Vol. 3: 147.
 116- Ibn baitar, 1993: 119.
 117- Ibn Duraid, 1987, Vol. 3: 47.
 118- Khalaf Tabrizi, 2012, Vol. 2: 243.
 119- al-Bakhshi, 2009: 143.
 120- Asgari, 1993: 364.
 121- Ibn Qayyam, 2016: 86.
 122- al-Bakhshi, 2009: 102.
 123- al-Damiri, 2003: 12.
 124- Ibn Qayyam, 2016: 31.
 125- Ibn Qayyam, 2016: 29.
 126- al-Bakhshi, 2009: 106.
 127- Ibn baitar, 1993: 115.
 128- Nickel et al, 1979: 238.
 129- Bonnie, 2018: 45.
 130- Ibn Qayyam, 2016: 42.
 131- Ibn baitar, 1993: 107.
 132- Asgari, 1993: 527.
 133- al-Khori, 2006, Vol. 4: 117.
 134- al-Bakhshi, 2009: 105.
 135- Ibn baitar, 1993: 104.
 136- Ibn Qayyam, 2016: 21.
 137- Ibn baitar, 1993: 113.
 138- Ibn Qayyam, 2016: 53.
 139- al-Bakhshi, 2009: 146.
 140- al-Damiri, 2003: 23.
 141- al-Bakhshi, 2009: 148.
 142- al-Bakhshi, 2009: 157.
 143- Ibn Qayyam, 2016: 130.
 144- Ibn Qayyam, 2016: 135.
 145- Bonnie, 2018: 44.
 146- Ibn Qayyam, 2016: 94.
 147- Ibn Qutaybah, 889: 31.
 148- al-Zamakhshari, 2013: 192.



retention of the horse¹⁴⁹.

- ***Al-Khavayah***: This is the sound coming out of a horse's larynx when it starts to move^{150, 151}.

- ***Zers Al-Fozool disease***: This is a problem in the dental and gingival system that causes damage to the inside or outside of the jaw and changes the jaws structure, causing changes in sound of the horse^{152, 153}. *Salsaal* and *Najim* sounds are heard¹⁵⁴⁻¹⁵⁶.

- ***Shagh Al-Haa (cracking of mouth)***: This is due to the pressure of the Tether, which causes wounds, infections. The pressure cracks the horse's mouth, causing pain and restlessness in of the horse, in addition to changes in the horse's voice and sound^{157, 158}. Excessive dry mouth and stinging of the tip of the horse's tongue by the scorpion (*Faoos*) can also be the cause¹⁵⁹⁻¹⁶¹.

- ***Jashash and Naib***: These voices are heard frequently in the horses¹⁶². It is the sound of the horse's nose fins during exhale¹⁶³. It will be equivalent to *Snort* in the modern veterinary medicine^{164, 165}.

- ***Naib***: It is produced when the horse is tired or restless¹⁶⁶. The equivalent of *naib*, *Roaror Trumpetin* modern veterinary medicine¹⁶⁷⁻¹⁶⁹.

Discussion and Conclusion

Referring to the veterinary history books and comparing them with the modern veterinary texts, one can identify the diversity and importance of proper distinction of sounds from infected horses and the impact of the diseases on their sounds, along with their consequential effects on larynx and pharynx. Special attention was given to the horses in this study, using the experience and information gained from ancient veterinary sciences and comparing them with modern veterinary sciences. This was performed with the least amount of harm to the animals, humans and the environment, as these experiments were practiced in an educational and therapeutic manner.

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- 149- al-Bakhshi, 2009: 48.
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Conflicts of Interests

The authors declare no conflict of interest regarding the publication of this paper.

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