Traditional methods used for controlling animal diseases in Iran

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Summary: In ancient times in Iran, infectious diseases of animals and human beings were referred to as choleraic diseases. Rhazes (9th century), followed by Avicenna (10th century), Jorjani (11th century) and others, had specific opinions on the cause and effect relationship in these diseases, which recall the fermentation theory of Louis Pasteur.

In ancient Iran, the methods adopted for veterinary procedures were those of general theoretical and practical medicine, including the humoral theory, accurate diagnosis, signs and symptoms, and the prescription of herbal and mineral medicines or substances of animal origin. If herbal treatment failed, cauterisation and surgery were used.

When refractory and contagious infectious diseases occurred, animals were evacuated from the infected region, in order to preserve their health, with resort to the mercy of Allah (God) as a final remedy.

Iranian scientists of ancient times had interesting views on rabies. A kind of serotherapy was used for treating persons bitten by rabid dogs.

Vaccination was performed many centuries ago by using dried smallpox lesions. In Baluchistan (Iran), infants were encouraged to play with and touch the teats of cows affected with cowpox, in order to immunise the children against smallpox, and this was centuries before the discovery of smallpox vaccine by Edward Jenner. Camelpox was also used for human immunisation. In the case of caprine pleuropneumonia, an extract or juice was obtained from the lungs of affected animals and was inactivated by treatment with certain herbal medicines which had a disinfectant effect. A thread coated with this extract was passed through the ear of healthy goats to render them immune.

The author lists various diseases and their treatment. This work forms part of detailed research by the author with reference to some 2,200 books and many ancient manuscripts on the history of veterinary science in Iran.

KEYWORDS: Animal diseases – History – Iran – Veterinary medicine.

INTRODUCTION

The history of veterinary medicine is divisible into two periods: ancient Iran, and Iran during the Islamic era.

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Iranians were originally owners of livestock. Horses were tamed and brought to Iran by the Aryans. In ancient Iran, the institutions for the treatment and care of animals and human beings were similar, and sometimes the same person was responsible for treating both humans and animals. According to the Vendidad section of the Avesta (the holy book of the Zoroastrians), a person who treated animals was the same person who treated human beings, i.e. a physician was also a veterinarian and vice versa (36). The head of veterinary medicine and animal husbandry establishments during the Sasanian period was called the akhvurbadh or hwcyrupt, while the person responsible for hunting and the wild fauna was called the nhcyrupt (33, 36).

In the early centuries after the rise of Islam, treatment of human beings and animals by the same person was common. Ancient Iranians called veterinarians pecheshk-sotour, which means ‘physician of animals’. Later, the Arabic word beitar was adopted, followed in 1937 by the Farsi word dampezeshk.

An akhvursalar or amirakhur (equerry), usually in the third rank of the civil hierarchy, was responsible for domestic animals, and through a veterinary office he controlled veterinarians who worked with horses. A ghoschian was a specialist responsible for eagles, hawks and other birds of prey, working under the supervision of a mirshekar (H. Tadjbakhsh, unpublished findings).

There has been little study of Iranian veterinary history, despite the existence of approximately 100 manuscripts on breeding and diseases of equines (farasnameh) and the breeding and diseases of poultry and birds of prey (baznameh). To compile such a history, the author has studied some 2,200 books and treatises, many in manuscript form, and has indexed some 12,000 items over a period of seven years. The results have been published in the first volume of a history of veterinary and human medicine in Iran (36). A second volume will deal with the Islamic period in Iran.

In the present account, the methods of veterinary medicine in Iran will be considered briefly, with special attention to communicable diseases. In ancient Iran, horses were the most important animals, and ruminants were considered to be of lesser importance. The great importance of horses was no doubt due to the need to guard frontiers and to make conquests. On the other hand, there were large numbers of ruminants, particularly goats and sheep, in areas thinly populated by humans, where grazing was relatively rich. Either little attention was paid to their treatment, or they were treated according to traditional methods by village veterinary technicians (beitaran-i-deh).

**VETERINARY PROCEDURES FOR COMMUNICABLE DISEASES IN ANCIENT IRAN**

In ancient times, Iranians referred to communicable diseases, whether of man or of animals, as amraz-i-vaba'i, which means choleraic diseases. These diseases were studied extensively by Mohammad ibn Zakariya Razi (also known as Rhazes), Ibn Sina (also known as Avicenna) and other Iranian medical scientists.

**VIEWS ON THE ORIGIN OF COMMUNICABLE DISEASES**

Rhazes (Fig. 1) was born in Rey (near Tehran) in AD 854. For the first time anywhere in the world, he studied communicable diseases scientifically and in great detail, publishing the book Al-Jadri va al-Hasbah ('Smallpox and measles') (24). Rhazes was
the first writer in medical history to express an opinion concerning infectious diseases (referred to as nazariyeh takhmirie) which is similar to the fermentation theory subsequently developed by Louis Pasteur some 900 years later (leading to the discovery of the causes of microbial diseases). Rhazes believed that a kind of yeast, which existed in the blood, was transmitted from mother to embryo and was responsible for smallpox. This yeast entered the blood to remove harmful substances, and smallpox developed as a consequence of this reaction. According to the theory stated by Rhazes in the above book and in another book entitled ‘Tales and stories of patients’, smallpox could be transmitted to others (24, 25, 31, 34).

Avicenna (d. AD 1036) propounded the same theory in his Canon (‘Code’) (8), but expressed it rather more clearly. Avicenna also believed that absence of the blood of the mother from the body of a child was responsible for making the blood boil. He stated: ‘An agent from outside the body enters the blood and stimulates it, then mixes with other liquids, which results in the blood boiling’ (8). Avicenna believed that infection from outside was the external cause of diseases, and he also emphasised the transmission of diseases through contaminated water and polluted air. In a chapter on choleraic fevers, he mentioned smoke as seresht (a humour) which polluted the air and caused diseases. He believed that the transmission of certain diseases from carcasses to human beings involved infection, the nature of which was not understood (8).
Akhawayini Bukhari, author of a guide to the training of medical students published in the second half of the 10th century (5), stated that when blood fermented and boiled, it emerged from vessels towards the skin, and produced various effects, such as smallpox, measles and rubella. Sayyid Ismail Jorjani (AD 1024-1135), in his manuscript *Zakhireh Kharazmshahi* (Fig. 2) (14) referred to a group of diseases including tuberculosis, leprosy, smallpox, rabies, cholera and vitiligo as contagious, and expressed the possibility of the transmission of these diseases through polluted air and contaminated water. Air which contained disease-producing agents was called choleraic air. Infection of the air could result in the infection of blood and body fluids. Harmful water, affected by polluted air and contaminated land, was capable of causing bodily infections. Jorjani maintained that if water was heated or filtered it took longer to become spoil. In a chapter concerning diseases of physicians (14), he discussed the transmission of diseases, with reference to 'disease vapour' (*bokhar-i-bimari*) as the agent of transmission.

If 'microbe' is substituted for 'disease vapour', transmission cannot be defined better today than by Jorjani in the *Zakhireh Kharazmshahi* manuscript (14, pages 279-280). He clearly separated smallpox and measles, and stated that both diseases appeared as a result of boiling of the blood, similar to the way in which grape extract boils (14, pages 249-280). This theory closely resembled that of Rhazes.

All of these accounts agreed that an unknown factor entered the body from outside, leading to a kind of fermentation (which resulted in the production of a rapidly increasing and deadly product) and hence disease. The disease factor could enter water.

![Fig. 2](image)

**Fig. 2**

The first page of *Zakhireh Kharazmshahi* (14)
or air from the body of a dead animal or dead human being, and resulted in others becoming infected. In some cases, the infectious factor could arise from the soil (known to modern science as anaerobic bacteria).

TREATMENT OF DISEASE IN ANCIENT IRAN

Veterinary procedures adopted in ancient Iran were those of the general medical system. The principles of theoretical and applied medicine were adopted, including the theory of the four ‘humours’ (blood, yellow bile, melancholy, phlegm), accurate diagnosis based on signs and symptoms, and the prescription of herbs, minerals or products of animal origin, given singly or in combination. When medicinal treatment failed, cauterisation and surgery were used. The last resort for refractory conditions and highly infectious and/or fatal diseases was to enlist the mercy of Allah (God).

Prior to Islam, three groups of physicians and veterinarians were active in Iran: herbal physicians (gyiah pezeshk), who cured their patients with the help of herbal medicines; surgeons; and faith healers (do'a pezeshk), who cured by using complex formulas, holy words and faith. The latter may have provided spiritual peace of mind for the patient, a role similar to that of present-day psychologists.

Physicians and veterinarians of the Islamic era also prescribed various medicines, performed various medical procedures, and resorted to God for assistance, but the main medical and veterinary procedures were based on experimental science. To invoke the aid of God was the last resort in serious, rapidly-spreading diseases. The general public resorted to prayers and used various kinds of amulets (see below). In human beings, prayers lifted the spirit of believing patients, and this was no doubt effective in maintaining the neuro-hormonal balance of the body. A relationship is known to exist between the neuroendocrine and immune systems. A healthy and powerful spirit and nervous system strengthen the immune system, and vice versa. In the case of animals, bearing in mind that prayer was of benefit only to the owner, being kind to the animal was the most useful policy. In addition to prayer, fulfilment of the responsibility of the physician or veterinary surgeon was beneficial in most cases. Some ancient manuscripts on horses begin and end with mention of the use of prayer, together with accounts of diseases and therapies (6, 21, 32, 35, 36; H. Tadjbakhsh, unpublished findings).

Some specific infectious diseases are described below.

Rabies

Jorjani provided a good account of rabies (14, pages 638-639). He believed the bite of an ordinary dog differed from that of a rabid dog. He mentioned the possibility of rabies in other animals (wolf, jackal, fox, etc.) and transmission of the disease to human beings. The latent period of the disease ranged from one week to six months. Jorjani also accurately described the signs of the disease.

In the late 15th century, Youssef ibn Mohammad ibn Youssef stated, in his book Tibb-i-Youssefi (37), that ‘signs of rabies in a dog are red eyes, secretion of saliva, movements of head and neck, and holding the tail between the legs. The dog stretches its leg on the ground and cannot walk properly, showing uncoordinated movements. It attacks everything and howls; other dogs run away. A person bitten by a rabid dog becomes affected after one week, and develops a condition similar to madness. He desires to remain alone, and is fearful of light and water’ (37, page 74). In Hidayat al-Mutaallemin, Akhawayini Bukhari stated that the duration of the disease was forty days, and that the affected person was sure to die (5).
Treatment of rabies

The wound of a person bitten by a rabid dog should be kept open and it should be cupped so that the wound bleeds, or the wound should be sucked under special conditions in order to remove the poison (5, page 634).

Various medicines were prescribed for affected patients, including a compound medicine known as meri/abkameh, a mixture of stale wheat and barley bread, soaked in water and exposed to sunlight to ferment; sometimes seeds of celery, cinnamon and clove gillyflower were added (9, 10). Another substance, aloes (a herb similar to fennel), was also used, the ground seeds being eaten by the patient. The plant could also be placed on the bite wound of a human being or an animal (3, page 50). Another therapeutic plant was asafoetida (angodan) (9).

Rhazes, in his book on medical emergencies (Man la Yahzarahutabib), advised that a wound resulting from the bite of a rabid dog be 'dry-cupped', so that it bleeds (26). He advised application of a poultice of onion, mustard and garlic to the wound. Before the appearance of signs of rabies, treatment with infusion of Cuscuta epithymum, freshwater crustaceans, camel urine, liquorice, frankincense, etc. was prescribed (26). According to popular belief, the water of certain springs was beneficial (H. Tadjbakhsh, unpublished findings).

Destruction of dogs

During a visit to Khuzestan (south-western Iran) in 1843, Najmol Molk found that severe rabies infections occurred in human beings and animals. In some cases, the disease was regarded as so serious that the government had the biting animals killed. A physician whom Najmol Molk met at Shushtar used to write amulets for those bitten by a rabid dog, and prescribed the insect zorrah (Cantharis sp.) and other remedies for the disease (20).

A form of serotherapy

In his book on pharmacy, Abu Rayhan Biruni quoted Arrajani and stated that placing the dried liver of an infected dog on the wound of a bitten person gave good results (9, page 968). In the fifth volume of his Canon, Avicenna wrote: 'It is said and approved by most physicians that if the liver of a rabid dog is kept on the wound of the bitten persons, this will be beneficial' (8).

This is an interesting aspect of the research conducted in ancient Iran, being a kind of serotherapy. The liver of a rabid dog contains various antibodies against rabies, and if this is applied to a recent bite wound some antibodies might enter the wound. Therefore, the procedure might conceivably be effective in preventing rabies.

Rinderpest and African horse sickness

Plagues among horses and cattle are featured in the historical works of many countries. Sometimes these diseases caused major economic losses and even threatened the survival of governments (23, 30). Rinderpest in Iran was mentioned in the works of Sanai’ie (d. AD 1140) and Attar (d. AD 1229). The disease was reported to have killed 80% of cattle in eastern Iran (7, 28). The only remedies were to move cattle elsewhere, and to provide amulets.

In the biography of Shah Ne’matullah Vali, a great Sufi personality who died in AD 1430, it is stated that some of the tribes who were his followers left their homes due to the occurrence of a serious infectious disease in the area. He prayed for them and
asked them to return home and to place their trust in God, who would help them to evade this danger (16). In his travels in the Sarakhs region, close to the border with Turkmenia, Rokn al-Dawleh (1882) found that rinderpest sometimes killed cattle in the region. The people would sacrifice animals at the shrine of Niaz Ata (a holy person) when praying for their cows (17). A 17th century (?) manuscript in the personal collection of the author, contains prayers and designs for a number of amulets. The manuscript carries an illustration of an amulet to be used for diseases of horses (Fig. 3). The amulet was placed on the ground and horse was walked around it (18).

James Baillie Fraser, in an account of his travels in 1833, reported that in Gorgan and Turkman (north-eastern Iran) the people made cotton dresses for their colts in order to protect them from dangerous flies and the diseases carried by the flies (11). The present author witnessed this practice in various Iranian tribes up to 30 years ago, as a way of protecting horses from insects carrying African horse sickness virus.

Anthrax

Avicenna was acquainted with anthrax, referring to the disease as ‘Persian fire’ (nar-i-parsi) and ‘bright boil’ (joosh-i-akhgari) in the fourth volume of his Canon (8). Both descriptions apparently relate to localised anthrax. Jorjani believed that the disease was due to an infection (15, page 551; and 14, page 581). The description of

![Design for an amulet used against serious diseases of horses](Fig. 3)
anthrax by Akhawayini Bukhari states that the wound became hot and prickly, surrounded by black skin, and people called it ‘malignant pustule’. This was a fatal disease and, if not cured by drugs, the wound should be cauterised (5). Ibn Hindu, the Iranian physician and philosopher of the late 10th century, stated that the anthrax lesion was filled with gas and a thin fluid; the skin was sensitive and inflamed before the pustule appeared (13). Various medicines were used for therapeutic purposes, including pomegranate and gall-nut peel boiled in vinegar, and a mixture of vinegar and alum. If treatment failed, the last resort was cauterisation of the lesion (5). Certain Iranian tribes covered the lesion with the ashes of a kind of boneh (wild pistachio tree or Persian turpentine tree) mixed with lime, with resort to cauterisation if this failed (20). When an animal died of anthrax, its body was buried in order to hinder transmission of the disease to man (23; H. Tadjbakhsh, unpublished findings).

Glanders

Glanders is a zoonosis which used to be prevalent in Iran, causing considerable losses. The disease was referred to in ancient documents as khonam, and was regarded as one of the chief diseases of horses in Gabous-Nameh, a social, historical and literary text by Onsorol Ma'ali (22). A document which seems to belong to the 14th or 15th century states that glanders is manifested by the appearance of several blisters on the body of the horse; the blisters contain yellow fluid and eventually pus (18). For the treatment of this disease, a cream composed of lime, salt and fat from an old cow was prescribed. An alternative treatment consisted of a mixture of boiled hanzal (colocynth) seed, barj (Hyoscyamus sp.) peel, sesame and Persian sulphur. The same treatment was also prescribed for human glanders. The same source also states that broth prepared by boiling the carcass of a fox should be given to an affected animal. Another recipe elsewhere in the same book specifies a mixture of roasted, dried garlic, salt and vitriol for cutaneous glanders and farcy (6, 36; H. Tadjbakhsh, unpublished findings). The present author witnessed an outbreak of endemic glanders in 1972 at Dezli in the Kurdestan region of Iran which resulted in the death of approximately one hundred horses and asses, and ten humans.

PRIMARY VACCINATIONS

Uniform views regarding immunology can be found in various writings by early Iranian scientists. Abu Rayhan Biruni (d. 1038) mentioned zufa, a sweat secretion from a certain species of deer found in Armenia, which was useful for curing snake bite (9, pages 350-352). This particular deer was supposedly accustomed to eating vipers, and hence able to withstand their poison. Viper antitoxin appeared in sweat secretions on the forehead of the deer. The sweat gradually became dirty and thick, when it was known as zufa, and was used against snake bite (9). The same author also mentioned a theory of antibody and explained a kind of serum reaction using a special method. Rhazes wrote a small compilation on the subject of immunology (19, 27) (Fig. 4), which includes an explanation for allergic asthma caused by smelling rose flowers.

The use of liver from a rabid dog, placed on a bite wound, is a practical application of this concept of vaccination (see above) (8, 9).

Vaccination against smallpox

Several centuries ago, in Iran and some other countries of the Middle East, vaccination against smallpox was performed using dried smallpox crusts. By the 18th century, this procedure was being advocated in Britain by Mary Wortley Montagu (32),
First page of *Ressaleh Shammyeh* by Rhazes, regarding allergic asthma (27)

and subsequently in other European countries. The procedure was widely used by Iranian tribes. For example, the Sangesari tribe, situated approximately 200 km east of Tehran, practised vaccination under the name *avalbarsindetan*. Old women collected dried skins infected by smallpox. When required, the skins would be ground using a stone and mixed with water. A few drops of the suspension were applied to the dermis between the thumb and index finger by using a needle. In this way, children were rendered immune to the disease (2).

In 1798, Edward Jenner discovered that those who milked cows affected by cowpox became infected with this animal poxvirus, and were immune to smallpox. Later, cowpox was inoculated into human beings and thus vaccination developed, founding
the science of immunology. Vaccination saved the lives of tens of millions of human beings each year (32). The procedure was practised several centuries ago in the province of Baluchistan, on the border between Iran and Pakistan. Schilmer (29) mentioned that vaccination with cowpox had been practised in Baluchistan since ancient times. Children bearing wounds on their hands were encouraged to touch the skin lesions of an infected cow, which was usually easy to find; this procedure was called potogow. Schilmer tried to explain to these people that vaccination against smallpox was best performed by prickling with a needle, but without avail. He also quoted the statement of a British traveller that camelpox was prevalent in Baluchistan, and that it was as effective as vaccinia, according to the Baluchi leaders (29).

Thus, the Baluchis of Iran discovered vaccination centuries before Edward Jenner, but their knowledge failed to spread.

**Contagious caprine pleuropneumonia**

In most of the semi-arid regions of Iran, goats are the most common herbivores because the grazing land is too poor for other species. Contagious caprine pleuropneumonia is the main disease of such regions. The disease is gradual in onset and results in heavy losses. In regions of south-eastern Iran populated by Kerman and other tribes, an autogenous vaccine was being prepared centuries ago from the lung of dead goats. The method of preparing vaccine was practically the same in all districts. Shepherds of the Sangesari tribe used to cut the affected lung into pieces, which were ground with vinegar and garlic. After being passed through a fine cloth, the mixture was applied to a thread, which was passed through the ear of the goat by means of a needle. This rendered the goat immune, and provides an interesting early example of primary vaccination of livestock (2; H. Tadjbakhsh, unpublished findings). There seems to be no evidence that this type of vaccination was performed for other infectious diseases of livestock. This technique was perhaps found to be ineffective against rinderpest, anthrax, etc.

**VARIOUS DISEASES OF BODY ORGANS**

The diseases listed below were known to early veterinarians in Iran.

*Eye diseases*: nakaneh (a white membrane covering the eye), cataract, inflammation and swelling of the eyeball, conjunctivitis, keratoconjunctivitis, wounds, 'water from the eyes', etc.

*Diseases of the head and neck*: ‘melancholic humour’ of the head, inflammation of the head, spasm of head and neck, inflammatory conditions of the head and eyes resulting from forages.

*Diseases of the nose*: coryza, strangles, intranasal hyperaemia.

*Diseases of the chest and throat*: laryngitis, pharyngitis, blacktongue, diphtheria, coughing (as a result of pneumonia, bronchopneumonia or foreign bodies in the throat), lung lesions, allergic asthma, difficulty in breathing.

*Diseases of the alimentary tract*: colitis and intestinal intussusception (as a result of eating sand or the presence of a foreign body), colitis (resulting from exposure to cold or following stranguria), peritonitis, tympanites, etc.

*Diseases of the genital organs*: orchitis, balanitis, penis deviation, ‘lust of the horses and their infertility’, sterility of mares, metritis, vaginitis, fibroma, genital tract closures.
Wounds: bites from wild animals, injuries inflicted by shooting or sword, saddle and stirrup sores, snake bites, insect bites, etc.

Diseases of the limbs: inflammation of the knee, shoulder wounds, hoof lesions (swelling, wounds, erythema, necrosis), lameness, arthritis, gout, arthritic conditions (e.g. spondylitis), bone tumours, tendinitis, arthrotic and rheumatoid disorders.

Skin diseases: various eruptions, itchiness, allergic diseases, horse mange, alopecia, horse body louse infestation, etc.

Other diseases: back pain, displacement of vertebrae, swelling and inflammation of the back, ascites, hemiparalysis, fever, bodily dehydration, anorexia, emaciation, cold, diseases associated with hot or cold weather (or fatigue), jaundice, piroplasmosis, exostoses, neoplasms (and their metastasis), metabolic diseases, dental diseases, etc.

Treatment of these diseases

Treatments comprised drug therapy and surgery. Numerous medicinal preparations of mineral, plant and animal origin were used. The plants used are too numerous to list here. Treatments cited in Faras-Nameh were as follows (6):

Minerals and other chemicals: lime and tar, oils, crude oil, glass powder, Indian salt, salt stone, sulphur, philosopher's stone, orpiment, ammonium salts, alum (various kinds), ferrous sulphate, potassium sulphate, ferrous powder (and other ferrous salts), jujube salt, zinc powder, dust, sea foam, boiled water, fresh water.

Products of animal origin: suet, yellow oil, sheep tail fat, tallow, lard, trotter oil, oil from the hump of a camel, bovine bone marrow, donkey bone marrow, animal blood, powdered human skull, goat brain. The following recipe was prescribed for encephalitis: kill an owl, put in an earthenware pot and heat in a hot oven until ash results. Mix the ash with oil and apply to the affected part. A recipe for glanders is described above. Other recipes used ash of hoopoe, earthworms (for dressing wounds), human urine, donkey urine, owl gall bladder, wild goat gall bladder, goat hair, sheep leather, egg yolk, milk of various animals, honey, etc.

Some of these materials have disinfectant properties, while others may influence metabolism and enzyme activities.

Herbal medicines: literally hundreds of plants and herbs, and products derived from them, were used in ancient times in Iran, including the following: barley flour, ground barley, sarcocolla, fig, spinach, pomegranate peel, haltit, cedrate, aniseed, dried beans, bitter almond oil, Datura fastuosa, carrot, Opopanax chironium, leek, soaproot, colocynth, wild rue, common rue, asphodel, mustard, dates, cucumber, turmeric, saffron, cumin, olive oil, bran, old vinegar, sumac, true senna, nogella seeds, garlic boiled in oil, fumitory, common dill, wine (various kinds), sugar, caramel, aloes, pepper, camphor, clove gillyflower, pumpkin seeds, celery, gum tragacanth, white poppy leaves, sesame, flowers of various kinds, flower oil, rose water, coriander, Tamarin mannifera, wheat flour, wheat paste, raisins, bitter orange, etc.

Surgical interventions: Iranian veterinarians in ancient times knew more about external than internal operations. Cauterisation was practised skillfully in human and veterinary surgery, and was used when other treatments had failed. Sometimes the animal was kept in a dark place after cauterisation to encourage calmness. Purulent wounds were lanced.
Taking blood from veins was of great importance in human and veterinary surgery. Veterinary indications included severe congestion, chest pains, certain other highly painful conditions, food poisoning and allergy. The vein to be used and the amount of blood to be collected were specified. Sometimes the nose was punctured for tetanoid convulsions.

*Treatment of laminitis:* this was treated by massage, applying a poultice and in some cases by surgery, and lastly cauterisation. Hoof tenderness was treated by paring the hoof and applying a hot brick. For bone tumours, the skin was opened and the tumour excised. Cotton cloth was used to stop bleeding and to dress wounds.

*Colitis:* in cases of severe colic, suppositories and enemas containing onion juice, garlic or soap were employed. A band was placed around the body at the neck and back, and pulled tight to evacuate intestinal gases, or a reed was placed in the rectum to allow a continuous flow of gases. When the urethra was obstructed and the bladder was full, this was massaged (through the vagina or rectum) until empty.

*Ascites:* an incision was made in the floor of the abdomen to release the accumulated fluid. Surgeons were also adept at castration.

*Metritis and infertility in mares:* when the uterus was inflamed and the vaginal canal closed, pus and secretions were evacuated manually, then olive oil and suet were introduced, and a woollen pad was inserted to absorb secretions. Mares infertile as a result of fibroma or other neoplasms were treated by surgical excision of the tumour, followed by insertion of a woollen pad impregnated with musk, camphor, pepper and honey, to which a thread was attached so that it could be removed later (6, 10, 21, 36, 38).

Various eye diseases were treated surgically.

**TRADITIONAL TREATMENTS FOR THE PRINCIPAL DISEASES OF CAMELS**

The wool of camels was cut in May, to prevent shedding of the coat, which would render the animals liable to attack by flies. The camel handler would apply tar, turpentine or ‘wild rocket’ oil to the body of the animal, particularly for mange, which was common. This treatment was repeated until the condition resolved. Mange was a nuisance for the camels of caravans (1, 12). Sometimes camels developed perforating back sores, which were treated by applying tar and urine. The animals were subject to ‘influenza’ when sweating through carrying a heavy load. In this event, the small bone in the nose swelled and the camel breathed through its mouth. A cure was to massage the nose with a warm cloth. Then two fingers were inserted into the nostril to make the camel sneeze and to provoke bleeding. If this failed, the nose was cauterised with a hot iron, which was usually successful. Camels might also suffer from a diphtheroid disorder in which respiratory ducts became obstructed, and this was treated by making the camel eat boiled onion and raw egg. Trypanosomosis was known as del zanak. Affected camels preferred to lie in water and refused to eat; the condition was deemed to be incurable. To prevent this disease, the camel was tightly bound, then some small stones, heated in a fire, were placed on a board which was moved under the neck of the animal. This type of cauterisation was believed to confer protection, and perhaps it had the effect of stimulating the immune system. Even today, some specialists in acupuncture believe that moxibustion may replace vaccination for certain cases when stimulation of the immune system is required (4, 12).
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MÉTHODES TRADITIONNELLES UTILISÉES EN IRAN POUR LUTTER CONTRE LES MALADIES ANIMALES. – H. Tadjbakhsh.

Résumé : Jadis, en Iran, on qualifiait d'affections cholériques toutes les maladies infectieuses des animaux et des hommes. Rhazès (IXe siècle), Avicenne (Xe siècle), Jorjani (XIe siècle) et bien d'autres avaient déjà des théories particulières sur les liens de cause à effet de ces maladies, qui rappellent celle de Louis Pasteur sur la fermentation.

Dans l'Iran ancien, les méthodes vétérinaires s'inspiraient de la théorie et de la pratique en usage en médecine générale. On y retrouvait, notamment, la théorie des humeurs, la précision du diagnostic, l'étude des signes cliniques et des symptômes et la prescription de traitements à base de plantes et de minéraux ou de substances d'origine animale. On recourait également à la cautérisation et à la chirurgie lorsque les remèdes à base de plantes s'avéraient inefficaces.

En cas de maladies infectieuses contagieuses et rebelles, les animaux étaient évacués de la région infectée de manière à préserver leur santé et on s'en remettait, en dernier ressort, à la miséricorde divine.

En ces temps anciens les savants iraniens avaient déjà une bonne connaissance de la rage. Une forme de sérothérapie était utilisée pour traiter les personnes mordues par des chiens enragés.

On pratiquait, par ailleurs, il y a plusieurs siècles, la vaccination à l'aide de croûtes desséchées de lésions varioliques. C'est ainsi qu'au Baloutchistan (Iran), bien avant la découverte de la vaccination antivariolique par Edward Jenner, on encourageait les enfants à jouer avec les trayons des vaches atteintes de variole afin de les immuniser contre cette maladie. Les lésions varioliques du chameau constituaient également la base d'un vaccin utilisé chez l'homme. Dans les cas de pleuropneumonie contagieuse caprine, on recueillait les sécrétions pulmonaires des malades et on détruisait le germe à l'aide de plantes ayant des propriétés antiseptiques. Puis on enduisait un fil de cet extrait, que l'on passait à travers l'oreille des chèvres saines pour les immuniser.

L'auteur passe en revue diverses maladies et leurs traitements. Cette étude s'inscrit dans le cadre d'un travail de recherche minutieux effectué par l'auteur à partir de quelque 2 200 ouvrages et de nombreux manuscrits anciens sur l'histoire de la science vétérinaire en Iran.

Resumen: En el antiguo Irán, todas las enfermedades infecciosas animales y humanas se consideraban afecciones coléricas. Así, entre muchos otros, Rhazes (siglo IX), Avicena (siglo X), Jorjani (siglo XI) tenían teorías específicas sobre las causas de estas enfermedades que recuerdan la teoría de Louis Pasteur sobre la fermentación.

Los métodos veterinarios usados tradicionalmente en el país procedían de las teorías y prácticas médicas generales: teoría de los humores, precisión del diagnóstico, estudio de signos clínicos y síntomas, y prescripción de tratamientos a base de plantas y minerales o sustancias de origen animal. Si los tratamientos a base de plantas resultaban ineficaces, se recurría a la cautelerización y la cirugía.

En caso de enfermedades infecciosas refractarias al tratamiento, se evacuaban los animales sanos de la zona infectada para impedir su contagio y, en última instancia, se invocaba la protección divina.

Los hombres de ciencia iraníes de esa época tenían un buen conocimiento de la rabia; las personas que habían sido mordidas por perros rabiosos recibían un tratamiento que involucraba una forma de seroterapia.

Por otra parte, desde hace siglos se practicaba en Irán una vacunación a partir de costras desecadas de lesiones variólicas. En la región de Baluchistán, mucho antes del descubrimiento por Edward Jenner de la vacuna antivariólica, se instaba a los niños a jugar con pezones de vacas afectadas de viruela vacuna para inmunizarlos. Otras vacunas para uso humano se obtenían a partir de lesiones variólicas de camellos. Un tratamiento de la pleuroneumonía caprina contagiosa se basaba en la colecta del líquido pulmonar de animales enfermos con el que, previa destrucción de los gérmenes presentes valiéndose de plantas con propiedades antisépticas, se untaba un hilo con el que se perforaba las orejas de los animales enfermos, para inmunizarlos.

El autor recorre varias enfermedades y sus tratamientos respectivos. Su trabajo se inscribe en el marco de una investigación minuciosa, basada en el estudio de unas 2.200 obras y numerosos manuscritos antiguos sobre la historia de la ciencia veterinaria en Irán.


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