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Muslim Contributions to the Cure of Smallpox: An Analytical Study of Al-Rāzī's Medical Legacy

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Abstract:

Smallpox, an epidemic disease with unknown origins, first appeared around 10,000 BCE in Indian subcontinent or north eastern Africa. It spread to Europe and the Islamic world, causing significant death, particularly for children. European explorers brought it to the Americas, causing disastrous consequences. The Variola virus is the source of the highly contagious smallpox disease. Smallpox disease which causes fever, exhaustion, and a characteristic skin rash that develops into pus-filled blisters, has a high death rate and has historically caused a great deal of morbidity and mortality. It had affected people of every era. In ancient times, religious figures were also afflicted with the epidemic disease which according to the historians and medical professionals was small pox disease. Variolation was used in Asia before vaccination. The primary means of disease transmission are respiratory droplets and direct contact with contaminated things or diseased people. The purpose of conducting research is to find the history and nature of epidemic small pox disease that had affected. Also, Al-Rāzī's being a medical professional its work and findings on the epidemic small pox disease. The research also finds the contributions of the personalities in the ways developed for eradicating and getting rid of the deadly epidemic small pox disease. The methodology adopted for conducting this research is qualitative. Both the primary and the secondary sources are used for carrying out the research. The reader will come to know that by creating a vaccine against an epidemic smallpox using material from cowpox lesions, Edward Jenner invented vaccination. In 1980, the WHO proclaimed epidemic smallpox disease to be extinct. One of the biggest triumphs in the field of public health is the elimination of smallpox disease. Al-Rāzī, a prominent figure in measles and smallpox diagnosis, first differentiated between the two diseases in his book 'Kitab Al-Judarī wa al-Ḥaṣba', establishing the foundation for differential diagnosis in medicine. Epidemics in Islam are seen as tests for believers.

Keywords: *Smallpox, Epidemiology, Medical Contributions , Al-Judarī wa al-Ḥaṣba, Medical Legacy.*

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Introduction:

Smallpox, a deadly infectious disease, originated in north eastern Africa around 10,000 BC. It spread through trade and conquering, becoming well-established in China by the fourth century AD and spreading to Japan and the Indian subcontinent by the seventh century. During the medieval era, up to thirty percent of cases died. Epidemics were common, with Native American communities suffering greatly from epidemic smallpox disease introduced by European explorers and colonists. Up to ninety percent died, aiding the fall of civilizations like Inca and Aztec Empires. Smallpox disease protection was obtained through variolation, a risky but effective method that reduced illness severity. Smallpox disease cases decreased in Europe and North America due to the 19th century vaccine, but the World Health Organisation continued its global eradication campaign in 1967. The last recorded smallpox incidence occurred in 1977, and the first and only disease to be completely eradicated was epidemic smallpox disease in 1980.

Al-Rāzī, a Persian physician and scholar, is credited with the historic elimination of epidemic smallpox disease. His work, *Kitab Al-Judarī wa al-Ḥaṣba'* or "The Book of Smallpox and Measles," is considered one of the first comprehensive investigations into the disease, highlighting the importance of international health initiatives. *Al-Rāzī* identified the differences between measles and smallpox disease, which were often mistaken for each other. He provided detailed clinical explanations of smallpox disease, including its course, signs, and symptoms. He observed trends in smallpox disease epidemic incidence and proposed that survivors could develop immunity and affecting youngsters more. *Al-Rāzī* suggested symptomatic therapies like emollients, cold treatment, and careful diet and hydration to alleviate smallpox symptoms. *Al-Rāzī* explained symptoms, rash, fever, pustule location, appearance, and interval. His theory predicted immunity and disease resistance theories. *Al-Rāzī's* research on smallpox disease significantly influenced medical understanding in Europe and the Islamic world, distinguishing it from measles. His clinical observations were cited by generations, and his translation into Latin and other languages remains influential.

Smallpox disease has been present in *Arabia* since prehistoric times, likely due to trade routes. *Arabia* has experienced numerous severe outbreaks, causing significant loss of life. A sudden epidemic of smallpox disease, often associated with the annihilation of *Abraha's* army, has been linked to the Qur'ānic phrase "*Ḥijārah min sijjīl*." Despite the miraculous nature of the birds and stones, the illness's exact form remains unknown. The incident marked a turning point in *Arabia's* pre-Islamic history, with its religious and symbolic significance outweighing any historical or medical value. The Qur'ān suggests misfortunes, such as illnesses, as Allāh Almighty's tests to purify believers and identify those who remain faithful. Disasters and epidemics are seen as divine vengeance for disobedient communities. Some Muslims believe natural and spiritual factors contribute to diseases, emphasizing the importance of compassion, medical attention, and public health while maintaining faith in Allāh Almighty. This balance involves heeding medical advice and participating in community initiatives.

1. History of Small pox disease:

Life is full with infectious diseases, pandemics, epidemics, and other natural disasters. Throughout human history, numerous hardships and natural disasters, including famines and infectious diseases, have occurred.[1]

Prehistory loses track of the smallpox disease's natural history. Around 10,000 BC, when the earliest agricultural villages in north-eastern Africa emerged, is when it is said to have first appeared.[2] Three mummies with skin covered in lesions resembling the smallpox rash were dated to the 18th and 20th dynasties (1580 to 1350 BCE and 1200 to 1100 BCE, respectively).[3] Smallpox, an ancient disease, originated in East Asia and involved lifelong immunity. It was first identified in China, India, and Southwest Asia in the 4th, 7th, and 10th centuries A.D. Before westward exploration, no credible descriptions existed in America or sub-Saharan Africa. In the 19th century, mild outbreaks with low CFRs were reported, named alastrim minor. The evolution of epidemic smallpox disease remains unclear due to gaps in records.[4] Scars on Egyptian mummies, including *Pharaoh* Ramses V's, are oldest physical evidence of VARV infection, but molecular mechanisms and comprehensive works from that era are lacking. Aaron of Alexandria first reported smallpox in Egypt in 622 CE, possibly transported to the East by Egyptian traders. Writings from 300-900 CE describe illnesses in Ethiopia, Persian, and Syrian populations, with *Al-Rāzī* providing the most accurate description. Smallpox, a disease with a history dating back to the 11th century BCE, was first mentioned in Sanskrit texts in India. The introduction of epidemic smallpox disease into China is debated, with some suggesting it was introduced between 25-49 CE. Buddhism, trade, and invasions may have influenced its spread to Japan and Europe in sixth and seventh centuries CE. Saint Nicaise suggests Hun invasion coincided with French populations IN 451 CE, possibly due to Moorish invasions in southwest Europe during the Middle Ages.[5] The term "variola," which was first used to refer to smallpox disease in AD 570, was coined by Bishop Marius of Avenches, Switzerland, which is close to Lausanne.[6] The Abyssinian army had faced off against the elephants in 570 AD resulting in an epidemic pestilence of small pox disease suggested by medical historians from Africa, first appearing in Egypt around 570 AD, as per Aaron's Alexandrian account.[7]

1.1. Smallpox disease epidemic in the second millennium CE:

The Crusades significantly influenced the spread of smallpox disease in Europe during the 11th and 13th centuries CE, with two likely cases found in historical records from Constantinople. Smallpox disease continued to spread during the ensuing years, and by the 1500s, it was thought to be endemic in most of Europe, ranging from Iceland to Spain. As seen by the disease that left England's Queen Elizabeth I deformed in 1562, royal houses were also impacted. The epidemic disease spread throughout Russia in 1623 and Siberia in 1630.[8] Smallpox disease, originating from Latin varius and varus, was first referred to as small pockes in England in the 15th century. Survivors developed immunity, and as early as 430 BC, they were asked to treat sick. Various herbal, cold, and special cloth treatments were used in the middle Ages. Dr. Sydenham (1624-1689)'s approach to patient care included forbidding fires, keeping windows open, dressing patients to the waist, and providing small beer. However, vaccination was the most effective method for preventing an epidemic smallpox disease. The term "inoculation" refers to subcutaneous injection of the virus into non-immune individuals. Vaccination developed independently during epidemics, but it also had associated risks. Variolation, or vaccination, was used in Africa, India, and China before being introduced to Europe

in the 18th century. Circassian traders introduced it to the Turkish "Ottoman" Empire in 1670. Travelers from Istanbul introduced variolation to Europe, with Emanuel Timoni in 1716 and Giacomo Pilarino in 1716 detailing the technique.[9]The death of Queen Mary II in 1694 predicted the 18th century's destruction. The 16th century Spanish and Portuguese colonies were linked to the arrival of smallpox disease in the New World, resulting in 3-4 million deaths and spreading throughout Central America due to slave trade and West African contaminated ports.[10] Smallpox epidemic began in the 17th century, supplanted by the bubonic plague. European colonization led to the first epidemics in North America, including Massachusetts and Boston. In a population of about 160 million in 1750, smallpox disease killed 400,000 Europeans annually and impacted all spheres of society. [11] Emperor Joseph I of Austria, King Louis XV of France, Tsar Peter II of Russia, King Luis I of Spain, and Queen Ulrika Eleonora of Sweden were among the other rulers who passed away.[12] Smallpox disease first surfaced in southern Africa in 1713 (Cape Town), and after spreading to the Australian continent in 1789, it was regarded as a significant worldwide endemic illness by the end of the 18th century.[13] Studies on rodent variola-like viruses, such as the Black Death and Variola major, suggest they may have originated from the same species. The virulence of infections varies between species.[14] Smallpox disease an epidemic introduced to Europe during the fifth and seventh centuries, significantly impacted Western civilization. Smallpox, a disease causing widespread disease, was a precursor to biological warfare. During the French-Indian War (1754-1767), British commander Sir Jeffrey Amherst used it to suppress American Indians. The slave trade also contributed to its spread, resulting in 400,000 deaths in Europe in the 18th century, and one-third of those who survived became blind. [15]

2. Variolation:

Variolation, or engrafting, is a practice of administering contaminated material to protect against smallpox disease, used in China, the Ottoman Empire, and the Arab world. Scholars like Emanuele Timoni FRS in 1721, presented a Latin presentation to the Royal Society, detailing his experience during the smallpox disease pandemic in Constantinople in 1714 and Jacob Pylarini have contributed to this technique in 1716.[16] Variolation an ancient Asian practice of contaminating non-immune patients with smallpox disease pustule fluid, led to vaccination. Lady Mary Montagu in 1721, introduced this practice to the UK after experiencing a severe smallpox disease attack, revealing Harem women's immunity.[17] The smallpox disease vaccine, initially used as a biological weapon, gained popularity due to bioterrorism fears, but thirty percent vaccine-related morbidity makes mass vaccination challenging. Smallpox disease epidemic, initially used as a biological weapon during French and Indian Wars, was reduced by Edward Jenner's 1796 research, leading to the rapid global spread of cowpox inoculation. [18] In sub-Saharan Africa, over 2% of vaccinated individuals experienced severe illness. Vaccination was advised for preparation and isolation, but some medical professionals opposed it.[19]

3. Edward Jenner:

Edward Jenner, the son of Berkeley's vicar, the Rev. Stephen Jenner, was born in Berkeley, Gloucestershire, on May 17, 1749.[20] Edward Jenner, a dairymaid's apprentice, discovered cowpox's protective properties and concluded it could spread, despite being immune. He infected James Phipps in 1796, vaccinating him again, but the Royal Society rejected it. In 1798, Jenner published an investigation into the causes and effects of the Variolae Vaccinae, a treatment for cow pox in western England. The medical community's response to the Inquiry's publication varied. Jenner sought immunisation volunteers in London but found none. Surgeon Henry Cline and Drs. Pearson and Woodville advocated immunization in 1799. Jenner's national survey supported his theory, and vaccinations grew rapidly in England and Europe by 1800. In 1800, Dr. John Haygarth obtained a vaccine from Edward Jenner and shared it with Benjamin Waterhouse. Jefferson supported Jenner's work at the National Vaccine Institute, but he didn't profit financially. Jenner led to England's 1840 vaccination outlaw. Jenner married in 1788, occupied Chantry House, transformed into Jenner Museum in 1985. Constructed "Temple of Vaccinia" in garden, provided free vaccinations to underprivileged.[21]

3.1. From variolation to vaccine:

Edward Jenner was among those who underwent excruciatingly "enhanced" treatment after being vaccinated as a young child in 1757. During his recovery, a doctor postulated that immunity could be passed across species through cowpox, a disease causing hand sores after milking sick cows. Inoculating a child with cowpox material in 1796, the child experienced mild symptoms. Jenner's invention of vaccination, derived from the Latin words vacca and vaccinia, led to the adoption of vaccination as a secure substitute for variolation. The National Vaccine Act of 1840 established the first-ever guaranteed free medical treatment for new-borns in British history, outlawing variation.[22]

3.2. Vaccination:

In 1967, the WHO launched the Intensified Smallpox disease Eradication Campaign, aiming to eradicate the epidemic disease, which caused 10-16 million cases annually and 2.6 million fatalities in 31 countries, particularly in naive populations. Spanish colonizer Francisco Pizzaro used smallpox in Inca coups, and General Amherst granted Bouquet's request to eradicate Native Americans.[23] Vaccination is important to reduce epidemic smallpox disease incidence in bioterrorism scenarios, but American civilians haven't been vaccinated since 1972, making them vulnerable to variola. Vaccination induces a cytotoxic response, and mild reactions can occur. Renewal is recommended every five years. [24] Before the World Health Organization's successful 1959–1979 eradication campaign, smallpox disease accounted for ten percent of all fatalities globally.[25] Together with tuberculosis and malaria, smallpox disease was one of the three most common and deadly diseases in the globe until 1960.[26] The World Health Organisation (WHO) was successful in eradicating small pox disease by 1977. In 1980, the WHO Assembly suggested stopping immunization.[27]

4. Types of Small pox disease:

Although there are many different types of smallpox disease such as conventional smallpox disease and haemorrhagic smallpox disease are the clinical forms that most closely resemble the smallpox disease outbreak of Thucydides' account of the plague of Athens.

4.1. Conventional Smallpox disease:

Thucydides' description of smallpox disease, which is often associated with severe headaches or backaches, is inconsistent with the actual disease. He also fails to mention the presence of the disease, suggesting it may not be a blister or sore. The crimson, blotchy rash from the cephalad to the caudad suggests smallpox disease is not the cause, as smallpox disease vesicles appear as macules at the hairline and move downward from the face.[28]

4.2. Haemorrhagic smallpox disease:

During the prodromal phase, haemorrhagic smallpox disease manifests abruptly as a fever, facial swelling, and a petechial rash.[29] Haemorrhagic smallpox disease can present with a rash similar to measles or scarlet fever, purpuric or petechial. The prodromal period's rashes occur before the haemorrhagic smallpox disease rash, which spreads quickly and often leads to death. Thucydides omitted the mention of poxes in the Athens epidemic, as all cases were deadly. However, his description of blisters or sores without specific anatomical location casts doubt on the smallpox disease diagnosis. Thucydides' observations suggest smallpox disease was the cause of the Athens plague, with survivors resistant to recurrence. He noted differences between conventional and haemorrhagic smallpox disease, with haemorrhagic being the most deadly. The Athens plague is better explained by a combination of haemorrhagic and conventional smallpox disease, with gangrene in extremities and loss of vision.[30]

5. Transmission:

To transmit smallpox disease from one person to another, there must be direct and reasonably extended face-to-face contact. Additionally, direct contact with contaminated materials like beds or clothing or human fluids can spread smallpox disease. Rarely, viruses that are conveyed through the air in confined spaces like buses, trains, and buildings have been known to spread smallpox disease. If isolation of the case is delayed, transmission can happen more readily in a hospital setting. If the virus is employed in biological warfare, it is most likely to spread via an aerosol cloud. There is no known way for animals or insects to spread smallpox.[31]

6. Symptoms:

Smallpox disease infections involve three stages: prodrome, pox, and incubation, with prodrome causing high temperature and symptoms, and incubation lasting 7-14 days, characterized by macules, papules, vesicles, and scabs.[32] Smallpox disease rash is identified by firm, circular lesions on palms and feet. Haemorrhagic and flat infections are less frequent but more serious. [33] Its death rate can reach thirty percent without vaccinations, with "hemorrhagic smallpox disease" causing death and significant bleeding.[34] Aerosolized smallpox, highly contagious, quickly vanishes in air or sunlight. Isolated from 13-year-old scabs, it's viable outside a host, and contaminated clothing rarely causes infection. [35]

7. Treatment:

Smallpox disease management involves isolating the infected person or people in a negative pressure chamber for 17 days, using appropriate precautions, and not relying on

FDA-approved treatments. Supportive medical care is recommended, and broad-spectrum antibiotics with β-lactamase inhibition should be given for suspected secondary infections. Cidofovir, approved for smallpox therapy and prevention, has shown effectiveness against various poxviruses in vitro, reducing cowpox mortality in animals by sixty to hundred percent. It may be helpful for those unable to receive vaccinia vaccination.[36]

8. *Islamic Literature and Al-Rāzī's* detailed account on smallpox disease

Iran's Ray was the birthplace of *Abū Bakr Muḥammad ibn Zakariyyāʾ Al-Rāzī* (864–930 C.E.). He rose to prominence as a medical and alchemical expert at a young age, drawing patients and students from far-flung regions of Asia.[37] *Rhaze*, a renowned physician and writer between Galen and the Renaissance, was a rationalist, fearless, and unbiased thinker.[38] *Al-Rāzī*, a prominent physician and alchemist, led the first Royal Hospital at Ray and later led *Muqtadari* Hospital in Baghdad. He wrote over 200 publications, with his medical works, including *Kitāb al-Manṣūrī*, *Al-Ḥāwī*, *Kitāb al-Mulūkī*, and *Kitāb al-Judarī wa al-Ḥaṣbah*, achieving enduring renown.[39] *Aḍud al-Dawlah* requested a location for *Bīmāristān al-ʿAḍudī*, and he developed putrefaction by hanging meat in different cities and observing slow putrefaction.[40] He chose a location with decomposing animal parts, potentially forming the basis for germ theory.[41]

8.1. *Al-Rāzī's* treatise on small pox disease:

Muḥammad Ḥamīdullāh (1989) argues that *Al-Rāzī's* treatise on smallpox disease and measles is his most significant medical contribution. He provided a detailed description and differential diagnosis of an epidemic smallpox disease symptoms, describing it as a disease that develops when blood boils and becomes infected. Smallpox disease can strike during childhood or other times, and its spread can be likened to wildfire. *Al-Rāzī's* concept of acquired immunity explains why those who survive do not contract it again.[42]

8.2. *Al-Judarī wa al-Ḥaṣbah:*

His book *Al-Judarī wa al-Ḥaṣbah*, which was primarily based on *Al-Rāzī's* original contribution, was the first treatise on chickenpox and smallpox disease. It has been translated into several European tongues.[43] The first known description of epidemic smallpox disease is found in a ninth-century story by *Al-Rāzī* which is considered a "masterpiece in clinical medicine".[44]

The first chapter explains that smallpox disease attacks are more likely to affect older individuals during epidemics, while children and young adults are more susceptible due to their hotter, humid blood. The second chapter discusses vulnerable body types and seasons, with thin, hot, and dry bodies being more susceptible.[45]

The third chapter details a smallpox disease eruption, accompanied by back discomfort, nasal itching, and nightmares, presenting symptoms like fever, back pain, prickling, and intense redness.

Measles is caused by bilious blood, while smallpox disease causes back discomfort due to distension of major veins and arteries near the spine's vertebrae. [46]

The fourth chapter discusses managing smallpox disease in general. The fifth chapter discusses preventing smallpox before symptoms appear, reducing spread, and suggesting specific diets for patients based on age and condition. The sixth chapter discusses factors causing faster skin lesions, massage, cold water, and herbal remedies, while the seventh

chapter emphasizes proper care for organs like the throat, eyes, and ears. The eighth and ninth chapters provide restrictive therapy strategies and advise medical professionals to allow illness progression, advising patients with less severe conditions to use hot water bandages and rice.[47] The eleventh chapter explores drugs to mitigate smallpox's effects on the body, including the eye, and suggests various ointments, including animal-based ones.[48] The twelfth chapter discusses dietary planning for respiratory illnesses like measles and smallpox disease, while the thirteenth chapter emphasizes prevention, therapy, and doctor-led outbreaks to prevent complications.[49] The fourteenth chapter discusses prognosis, with symptoms like dazzling colour, intense pain, fever, sleeplessness, and nose itching indicating poor or positive prognosis.[50]

8.3. *Al-Ḥāwī fī al-Ṭibb:*

Measles and smallpox disease are red skin maculae, with measles patches appearing all over the body at once, and smallpox eruptions appearing patchily over a few days, with black and violet hues indicating poor outlook.[51] Smallpox disease, a mild illness, is most likely to be widespread in late October and hot, dry summers and fall without rain. In 1856, the Smallpox disease Hospital in New York City treated up to 120 patients and was the first to receive victims of contagion and plague epidemics. [52] New Yorkers were allowed to stay home during cholera, TB, typhoid, and yellow fever, while immigrants and impoverished were quarantined on boats or Manhattan's outlying islands. City dwellers with smallpox were required to be quarantined.[53]

8.4. *Al-Taysīr fī al-Tadbīr wa al-Muʿālajah:*

Ibn Sīnā quotes *Al-Rāzī's* writings on smallpox disease and measles in his book Al-Qanun, distinguishing between the two diseases with distinct symptoms and skin eruptions, but not crediting *Al-Rāzī's* work. *Ibn Zuhr* translated *Al-Taysīr fī al-Tadbīr wa al-Muʿālajah* into Hebrew, Latin, and other languages, published under Facilicito Adjumentum. He treated measles and smallpox disease as one illness, citing *Ibn Sina* and *Al-Rāzī.*

8.5. *Al-Qānūn:*

Ibn al Nafis passed away at Cairo in 1288, having been born in Damascus. *Al-Qanun* is thought to have been revised in his book The Concise Book of Medicine. As a result, *Ibn al-Nafs* quickly restated what *Ibn Sina* had said regarding measles and smallpox disease. He made a distinction between the two illnesses, however he did not identify back discomfort as a distinct smallpox disease symptom.

8.6. *Tadhkarit Dāwūd:*

Dawud al-Antaki passed away at *Mecca* in 1599, having been born in *Antaki*. He compared the symptoms of smallpox disease and measles to those of *Al-Rāzī* in the first section of his medical book *Tadhkarit Dāwūd* and made a distinction between the two illnesses. He discussed chicken pox in the same chapter and said it was a harmless variation of smallpox disease.

8.7. The Physian's dictionary:

Egyptian *Mādīn al-Qawsūnī* lived in the seventeenth century. He mentioned that he had quoted from *Al-Qanun* when describing the symptoms of smallpox disease and measles in the first chapter of his book The Physian's dictionary. He distinguished between the two illnesses by stating that smallpox disease causes a thick lesion that protrudes outside the skin, whereas measles causes a small, thin lesion that stays inside the skin.[54]

9. Example of diseases similar to epidemic small pox disease afflicted to Prophets in Islam:

Al-Rāzī claims that the discussion of epidemics in the Qur'ān is frequently connected to the suffering given down by Allāh Almighty. Epidemics are said to arise as a result of human disobedience, oppression, disbelief, and corruption. The Qur'ān contains 373 instances of the term "*Azāb*." *Azāb* refers to anything that weighs down the soul and brings about suffering for people, both here on Earth and in the afterlife. The term "*Azāb*" is used in the Qur'ān and is classified into two categories: (i) *Azāb* in this world and (ii) *Azāb* in the hereafter. *Thaun* and other pandemic diseases are among the Qur'ānic ailments that *Al-Rāzī* addressed.

9.1. Disease afflicted to *Abū Lahab:*

The narrative surrounding *Abū Lahab's* demise is likewise linked to an epidemic; though some claim it was an outbreak of *Adāsah* (blisters) which spread all over the body of *Abū Lahab* and gave off an offensive stench.[55] Seven nights went by after the Battle of *Badr*, save for the fact that *Abū Lahab* developed a weird illness resembling smallpox disease that left him covered in boils and sores all over his body. The *Quraysh* greatly feared this illness, and they. None of them even got near him to tend to him in that situation because they thought it was extremely contagious epidemic disease. Ultimately, he tormented and died alone from that same terrible sickness. His boys were so afraid of his dead body that they refused to even approach it after he passed away. The boys were pushed to dispose of their father's decaying body by the people, who felt ashamed due to the cursed contagiousness of his sores. The idolaters supported Abū Lahab agreed to help, washing the body, transporting it to a distant location, excavating a hole, and filling it with stones from a distance.[56]

9.2. Disease afflicted to *Abraha* and his army:

In addition to the *thaun* epidemic, *Sayyid Qutub* (1991) notes in his book Fi *Zilal al-Qur'ān* that there is a story that describes how the smallpox disease epidemic began to spread throughout Makkah at the time of the elephant army.[57]

وَأَرْسَلَ عَلَيْهِمْ طَيْرًا أَبَابِيلَ تَرْمِيهِم بِحِجَارَةٍ مِّن سِجِّيلٍ.[58]

''And sent against them birds, in flocks. Striking them with stones of Sijjīl.''

This interpretation of the term " *Ṭayran* " holds that the blisters that appeared on the elephant soldiers' bodies were caused by an epidemic spread by a flying object. The word "*Ṭayran*" can refer to both a bird and an insect, such as a fly, mosquito, or other flying creature that carries a virus. According to *Surah al-Fil*, the animals in *Abraha'*s story spread the disease to him and his army, causing their bodies to resemble caterpillar-eating leaves.[59] In order to annihilate *Abraha'*s army, Allāh Almighty sent innumerable birds that originated from the coast.[60] The stones those birds were carrying were forged by the hellfire. It was permitted for each bird to toss three stones. They carried two bombs in their feet and one in their beaks. They arrived by air, launched an assault on the soldiers, and wreaked havoc. And vanished beneath the earth, causing their corpses to develop abscesses, begin to bleed, and have an awful stench. They had rotten flesh. After

decaying, *Abraha's* chest was blurt.[61] These night time-dwelling birds are thought to be the mosquitoes that spread disease, causing epidemics and explosion.[62]

9.3. Epidemic afflicted to Children of *Isrā'īl:*

Rijz is the term for the Qur'ānic verses that deal with epidemics, according to *Al-Rāzī* in the Exegesis of *Mafātīḥ al-Ghayb*. It includes every type of epidemic that has affected people during the course of human history. Epidemics can lead people to constantly encounter instability in their personal life since they often emerge suddenly. *Al-Rāzī* says that among the deadliest forms of global calamity are diseases. It happened to the Children of *Israel* once, and it resulted in the deaths of 25,000 individuals in the course of half a day, from dawn to nightfall. The Exegesis of *Mafatih al-Ghayb* refers to this outbreak as *thaun*.[63]

فَأَرْسَلْنَا عَلَيْهِمُ الطُّوفَانَ وَالْجَرَادَ وَالْقُمَّلَ وَالضَّفَادِعَ وَالدَّمَ آيَاتٍ مُّفَصَّلَاتٍ فَاسْتَكْبَرُوا وَكَانُوا قَوْمًا مُّجْرِمِينَ[64]

''So We sent on them: the flood, the locusts, the lice, the frogs, and the blood (as a succession of) manifest signs, yet they remained arrogant, and they were of those people who were Mujrimun (criminals, polytheists, sinners).''

Furthermore, according to *Al-Rāzī*, the *Pharaoh's* subjects experienced diseases brought on by animals, including lice, blood, locusts, frogs other than the *thaun* outbreaks and storms.[65] The epidemic is a form of retribution by Allāh Almighty for human wrongdoings, punishing all, regardless of belief. It serves as a blessing for believers and degrades unbelievers.[66]

Al-Rāzī claims that the passages containing the word *"rijzun"* in surah 2 verse 162 as,

فَبَدَّلَ ٱلَّذِينَ ظَلَمُواْ مِنْهُمْ قَوْلًا غَيْرَ ٱلَّذِى قِيلَ لَهُمْ فَأَرْسَلْنَا عَلَيْهِمْ رِجْزًا مِّنَ ٱلسَّمَآءِ بِمَا كَانُواْ يَظْلِمُونَ[67]

The Children of *Israel* violated the command to submit, obey, and repent) plainly prove that the reason Allāh Almighty sent down the disease was due to human oppression itself. However, in Qur'ān in *surah al-Araf* verses134 says that the *Pharaoh's* people were sent epidemics because they were sinners because they denied the existence of God and claimed that the Prophet Moses (A.S) and his followers were to blame for all of their misfortunes.[68] As mentioned in Qur'ān that,

وَأَوْرَثْنَا ٱلْقَوْمَ ٱلَّذِينَ كَانُواْ يُسْتَضْعَفُونَ مَشَٰرِقَ ٱلْأَرْضِ وَمَغَٰرِبَهَا ٱلَّتِى بَٰرَكْنَا فِيهَاۖ وَتَمَّتْ كَلِمَتُ رَبِّكَ ٱلْحُسْنَىٰ عَلَىٰ بَنِىٓ إِسْرَٰٓءِيلَ بِمَا صَبَرُواْۖ وَدَمَّرْنَا مَا كَانَ يَصْنَعُ فِرْعَوْنُ وَقَوْمُهُۥ وَمَا كَانُواْ يَعْرِشُونَ ۝[69]

''And when the punishment fell on them they said: "O *Moosa* (Moses)! Invoke your Lord for us because of His Promise to you. If you will remove the punishment from us, we indeed shall believe in you, and we shall let the Children of *Israel* go with you."

9.4. Disease afflicted to *Ḥazrat Ayyūb (ʿAlayh al-Salām):*

Here comes another example of *Ḥazrat Ayyūb (A.S*), as stated in Qur'ān that,

وَ أَيُّوبَ إِذْ نَادَى رَبَّهُ أَنِّي مَسَّنِيَ الضُّرُّ وَ أَنْتَ أَرْحَمُ الرَّاحِمِينَ[70]

''And ˹remember˺ when Job cried out to his Lord, "I have been touched with adversity, and You are the Most Merciful of the merciful. So we answered his prayer and removed his adversity, and gave him back his family, twice as many, as a mercy from Us and a lesson for the ˹devoted˺ worshippers''.

Ḥazrat Ayyūb (A.S.) possessed a great deal of riches and land for farming and agriculture. However, when Allāh Almighty desired to put him to the test. *Ḥazrat Ayyūb*

(A.S.) began to develop blisters and vesicles on his body, which caused him to experience excruciating itching. They had developed into ulcers where tiny wombs were present and pus was beginning to emerge when he itched. The city's residents removed him from the area out of concern that he might not harm anybody else. Years went by in this fashion. Finally, he prayed to his Lord, saying, "O Allāh, the sickness and trials have engulfed me from every direction." Additionally, *He (A.S.)* stated, "You are the most merciful," and he said everything. By keeping in front the seerah of *Ḥazrat Ayyūb (A.S)*. They by holding the lap of patience they shall move forward.

At another place there comes:

فَاسْتَجَبْنَا لَهُ فَكَشَفْنَا مَا بِهِ مِنْ ضُرٍّ وَآتَيْنَاهُ أَهْلَهُ وَمِثْلَهُمْ مَعَهُمْ رَحْمَةً مِنْ عِنْدِنَا وَذِكْرَى لِلْعَابِدِينَ[71]

‘‘Allāh said to him strike the ground with your foot; here is a cool water to bathe, and a drink. And We let him have his family and the like of them besides, as a mercy from Us, and a reminder for the people of understanding’’.

Herd immunity, a universal law, protects immunized individuals from virus spread.[72] No one is immune to illness, pain, or disaster, as it affects everyone equally. Many suffer from cancer, allergies, back discomfort, and disabilities. Patients may survive despite medical advice, and physicians may even die from their own conditions.[73] Two approaches i.e. the spiritual approach and the physical method serves for combating epidemics. Spiritual approach involves endurance, patience, serenity, steadfastness and forbearance.[74] Conversely, the physical method involves maintaining personal hygiene, clothing, food, and shelter by abstaining from sins that bring about Allāh Almighty's punishment. This prevents epidemics and ensures a safe, healthy living environment, supporting a balanced human ecosystem. [75]

Summary:

Around 10,000 BC, a fatal viral epidemic disease called smallpox first appeared in north eastern Africa. Through conquest and trade, it expanded, reaching China by the fourth century AD, Japan by the seventh century, and the Indian subcontinent by the seventh. Up to thirty of cases in the mediaeval age resulted in death. Epidemics were frequent, and the smallpox that European explorers and colonists brought with them severely devastated Native American villages. Up to ninety perished, contributing to the decline of societies like the Inca and Aztec Empires. Variolation, a dangerous but successful strategy that lessened the intensity of the disease, provided smallpox disease protection. The vaccine developed in the 19th century caused a decline in smallpox disease cases in Europe and North America; but, in 1967, the World Health Organisation decided to carry out its worldwide eradication effort. Epidemic Smallpox disease was the first and only disease to be totally eradicated in 1980, with the final case being reported in 1977.

The epidemic smallpox disease epidemic that occurred in history is attributed to the Persian scholar and physician *Al-Rāzī*. His book, "*Kitab Al-Judarī wa al-Ḥaṣba*," also known as "The Book of Smallpox and Measles," is regarded as one of the earliest thorough studies of the illness and emphasises the significance of global health programs. *Al-Rāzī* differentiated smallpox disease from measles, explained its pathogenesis, symptoms, and indicators, suggested immunity in survivors, and recommended symptomatic treatments like emollients, cold remedies, and diet. The symptoms, rash, fever, pustule location, look, and interval were all described by *Al-Rāzī*. He saw trends in smallpox disease occurrence, with children being more affected. Immunity and illness resistance ideas were foreseen by his theory. *Al-Rāzī's* studies on smallpox disease

distinguished it from measles and had a major impact on medical knowledge in Europe and the Islamic world. Generations have referenced his clinical insights, and his translations into Latin and other languages continue to have an impact.

Arabia has seen smallpox cases since prehistoric times, most likely as a result of trading routes. Regional medical practices were established throughout the Islamic Golden Age thanks to the contributions of *Arab* intellectuals such as *Al-Rāzī*. *Arabia* has seen many catastrophic epidemics that have claimed a large number of lives. A sudden smallpox disease epidemic, frequently connected to the destruction of *Abraha's* army, has been connected to the Qur'ānic phrase *"Ḥijārah min sijjīl"*. The precise nature of the ailment is still unknown, despite the birds and stones appearing to be miraculous. The episode in *Arabia's* pre-Islamic history was significant due to its theological and symbolic significance. *Abū Lahab*, who fought against Prophet Mohammad (S.A.W), denied prophecies and suffered a contagious disease like small pox disease. This was a punishment from Allāh Almighty. *Ḥazrat Ayyūb (A.S)* also experienced the disease similar to small pox, but prayed for healing and was cured after praying to Allāh Almighty. Both Prophets' experiences highlight the importance of faith and perseverance. Muslims view disasters as divine retribution against disobedient societies, emphasizing compassion, healthcare, and public health while maintaining belief in Allāh Almighty and following medical advice. The belief is that disease development is influenced by both natural and spiritual factors, necessitating adherence to medical advice and involvement in neighbourhood projects.

Conclusion:

Smallpox, one of the deadliest diseases in human history, left a profound impact on societies across continents, including the Islamic world. Its devastating effects prompted both fear and inquiry, and its historical trajectory reflects humanity's evolving understanding of disease, medicine, and public health. Within the Islamic Golden Age, scholars like Al-Rāzī emerged as pioneers in the study of infectious diseases. . Imam *Al-Rāzī* was a philosopher, alchemy and a medical professional who first differentiated a small pox disease and measles. In which he discussed about all the symptoms of small pox disease, types conditions, its nature, diets, and treatments for those who are affected by it. His critical distinction between smallpox and measles in *Kitab al-Judarī wa al-Ḥaṣba* laid the foundation for clinical diagnosis and demonstrated the empirical approach that characterized Islamic medical tradition.

The Islamic world did not merely receive medical knowledge from other civilizations but contributed significantly to the global corpus of medical science. Al-Rāzī's observations predated many developments in Western medicine and inspired further inquiry into disease classification and treatment. Furthermore, the cultural and religious responses to epidemics within Islamic societies show a balance between faith, ethical responsibility, and rational medical practice.

Prehistory loses an original track of its origin, but around 1000 BC it is found in South Africa. Small pox disease lesions was found on the skin of three mummies in Egypt from 18th and 20th dynasties. It came in China, India and Asia in the fourth, seventh and tenth centuries. In 1500, most of the Europe was endemic due to small pox disease. In 16th century, many death occurred in the colonies of Spain and Portugal. The method of

variolation was introduced in China, India and America for protecting from disease. The reason of spreading the small pox disease was trade and the contaminated ports. In 17th century, it was spread to America and by the end of the eighteenth century the world was regarded endemic. Edward Jenner an English physician made a vaccine of small pox disease and use to treat patients which is regarded as one of the biggest achievement in the human history.

The eradication of smallpox in 1980 by the World Health Organization, largely credited to Edward Jenner's innovation in vaccination, represents a milestone in modern medicine. However, this success was built upon centuries of observation, experimentation, and public health initiatives, of which Islamic contributions form an essential chapter. This study, therefore, not only recounts the history of a disease but highlights the enduring value of cross-cultural medical knowledge and the importance of integrating historical insights with contemporary health strategies.

Recommendations:

- Classical works like Al-Rāzī's *Kitab al-Judarī wa al-Ḥaṣba* should be critically edited, translated, and made accessible for medical historians and scholars of Islamic studies. These texts offer valuable insights into early clinical methods and disease classification.
- Educational institutions, particularly in the Muslim world, should incorporate modules on the contributions of Islamic scholars like Al-Rāzī in the fields of epidemiology and public health to revive historical awareness and inspire modern research.
- Scholars should pursue interdisciplinary studies combining history, medicine, Islamic studies, and public health to better understand how past responses to epidemics can inform present and future strategies.
- Further research should explore how Islamic theology, law (fiqh), and ethics addressed issues like quarantine, treatment, and divine trials during epidemics an area especially relevant in light of recent global pandemics.
- Researchers should compare Islamic medical approaches to those of other historical civilizations, such as Greek, Chinese, and Indian systems, to highlight both unique contributions and shared scientific traditions.
- Policymakers and educators can use historical case studies like the eradication of smallpox to promote vaccine confidence and public health initiatives in culturally informed ways.

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