



## Identification of Leptospira Bacteria in Human Urine According to Islamic View

Muslimin Budiman Satryanto<sup>1</sup>, Dian Widiyanti<sup>2</sup>, Karimulloh<sup>3</sup>

<sup>1</sup> Student, Faculty of Medicine, YARSI University,

<sup>2</sup> Lecturer, Department of Microbiology, Faculty of Medicine, YARSI University,

<sup>3</sup> Lecturer, Department of Islamic Studies, YARSI University

Corresponding author: musliminbudiman@yahoo.com

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### ABSTRACT

Leptospirosis is a zoonotic infectious disease caused by pathogenic organisms belong to the genus *Leptospira*, which are transmitted directly or indirectly from animals to humans. Most countries in the Southeast Asia regions are endemic for leptospirosis. The incidence of leptospirosis is strongly influenced by various socio-cultural, occupational, behavioral, and environmental factors. The amount of risk depends on the prevalence of *Leptospira* in the local area and the frequency of exposure. One of the tests to confirm the diagnosis of leptospirosis is by isolating *Leptospira* bacteria with culture and molecular examination of a person's body fluid specimens such as blood, cerebrospinal fluid, or urine. To identify *Leptospira* bacteria in leptospirosis cases in humans, urine samples can be used. This examination is the development of methods used in medical science to diagnose leptospirosis. One of the verses in the Qur'an regarding science is "He is the One Who created everything in the earth for you. Then He turned towards the heaven, forming it into seven heavens. And He has "perfect" knowledge of all things." (Surah Al-Baqarah [2]: 29). From this verse, it can be concluded that Allah SWT created something on this earth, including urine in it, with the intent and purpose for all of His creation, so that his servants understand and worship Allah SWT and carry out their obligations as caliphs on this earth. According to the Islamic view, identification of *Leptospira* bacteria in the urine of workers is permissible because science and religion are related.

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### Introduction

Leptospirosis is a disease caused by the spirocheta bacteria of the genus *Leptospira*. There are 10 pathogenic species, and more than 250 pathogenic serovars (CDC, 2018). Transmission can occur through direct contact with animals infected with the bacteria leptospira or often through indirect contact with water or soil contaminated with urine

from infected animals.

Leptospire enter the human body through penetration of the oral and conjunctival mucous membranes or injury to the skin and pass through the bloodstream. In humans, leptospirosis will begin with a septicemic phase followed by immune manifestations. The most serious condition of this disease can involve damage to many systems, including

vascular, liver, kidney, lung, and damage to the bone muscles, commonly known as Weil Syndrome (De Brito et al, 2018). Leptospirosis is a bacterial disease that causes morbidity and mortality worldwide. Although the disease is endemic in many slum communities in urban or rural areas and can cause sporadic epidemics, little is known about the true burden of the disease. This disease is often undiagnosed because the signs and symptoms are difficult to distinguish from other endemic diseases and there is a lack of diagnostic laboratories available (Amin L, 2016).

Most of the endemic areas for leptospirosis are in the Caribbean and Central and South America as well as in Southeast Asia and Oceania (Costa et al, 2015). In Indonesia, six provinces reported cases of leptospirosis in 2017, namely DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, and Banten. Leptospirosis cases, which increased drastically in 2016 as many as 830 cases, decreased again in 2017, namely as many as 640 cases (Kemenkes RI, 2018). A person's risk factors for leptospirosis include: a). contact with water contaminated with *Leptospira* germs or rat urine during flooding; b). contact with rivers or lakes in bathing, washing, or working in these places; c). contact with rice fields or plantations (related to work) who do not use footwear (Kemenkes RI, 2015).

In one study, ten individuals without clinical symptoms (no episodes of fever in more than one year) and no serological evidence suggesting that a person with leptospirosis excreted the bacteria *Leptospira* for more than one year. This broadens the understanding of the conditions of leptospira carriers or carriers so that it can be said to be long-term asymptomatic leptospira (Ganoza et al, 2010).

Diagnosis can be confirmed through isolation of *Leptospira* bacteria from clinical specimens such as blood, urine, and cerebrospinal fluid, positive Polymerase Chain Reaction (PCR) results, and seroconversion of

Microscopic Agglutination Test (MAT) from negative to positive (Kemenkes RI, 2015). The slow growth of *Leptospira* in culture media takes about 4 weeks before being stated as negative culture results. Positive results on culture are very low, especially in ordinary microbiology laboratory facilities, so that for diagnostic support waiting for culture results is often an obstacle in patient management (Setiati et al, 2014). The most commonly used diagnostic tests are the Microscopic Agglutination Test (MAT) and IgM ELISA. MAT has unmatched serovar specifications and is the gold standard in diagnosing leptospirosis (Ahmed et al, 2012).

Culture and PCR examination in leptospirosis cases using urine samples is one way that can be used to identify *Leptospira* bacteria (Ministry of Health, 2017). This examination is the development of methods used in medical science to diagnose leptospirosis. In this study, we wanted to know how the law of identification of leptospira bacteria using human urine according to Islamic views. Then, the method used in this article is to examine the verses of the Qur'an, Hadith, and various references relevant to the issues to be discussed.

### **Leptospira Bacteria According to Islamic View**

Bacteria are prokaryotic microorganisms that are relatively small in size, about 1  $\mu\text{m}$  in diameter, and in the absence of a nuclear membrane. Bacteria are living things that cannot be seen by the naked eye and can only be seen using a tool, namely a microscope. In *Leptospira* bacteria, observations were made using a dark field microscope (Carroll et al, 2017). Its size is very small, making it a living creature that is different from the others. Allah SWT said: "Surely Allah does not shy away from using the parable of a mosquito or what is even smaller." (Surah Al-Baqarah [2]: 26)

From the quotation of the verse, we can know that Allah SWT gave parables to very small living things on this earth. Without

realizing it, these living things are around our environment and live together with humans. One of them is the *Leptospira* bacteria, a bacteria that can cause leptospirosis in humans and animals. Leptospirosis is an acute zoonotic disease caused by a spiral-shaped bacterial infection of the pathogenic genus *Leptospira*, which is transmitted directly and indirectly from animals to humans with a wide spectrum of diseases and can cause death (Kemenkes RI, 2017).

One of the risk factors for leptospirosis is the lack of healthy living habits in the community. One example is in the province of DKI Jakarta, the number of households that practice clean living behavior shows a fairly good percentage of 69.3%. The results of the monitoring of environmental health workers in all areas of DKI Jakarta Province in 2017 which included in the healthy home category were only 62.10% (Dinkes DKI Jakarta, 2018). The majority of risk factors for leptospirosis are caused by the behavior of a person who does not maintain the cleanliness of his environment and is due to his fault.

One of the verse quotes in the Al-Qur'an regarding events or events that are caused by human deeds themselves: "Corruption has spread on land and sea as a result of what people's hands have done, so that Allah may cause them to taste 'the consequences of' some of their deeds and perhaps they might return 'to the Right Path'." (Surah Ar-Rum [30]: 41).

The above verse quotation tells that all the damage on this earth is caused by human actions themselves. Allah SWT gives a test or trial to His people so that they can reflect on what they do. Because human actions that do not behave clean and healthy can cause a disease that causes someone to be sick. The Word of Allah SWT regarding pain or trials for His people: "Every soul will taste death. And We test you 'O humanity' with good and evil as a trial, then to Us you will 'all' be returned." (Surah Al - Anbiya [21]: 35).

In this verse, it is explained that Allah SWT gives trials to His servants with good or bad.

These tests or trials can be in the form of goodness that Allah SWT provides, one of which is health so that someone can be grateful and know that Allah SWT has given blessings and gifts to His people. On the other hand, Allah SWT can test His servants with ugliness, such as sickness and poverty, because it is hoped that His servants can be patient and ask for healing and sustenance both physically and mentally to Allah SWT (Rahmawati & Muljohardjono, 2016).

In every disease that Allah SWT sent down, one of which is Leptospirosis, there must be a cure. If someone takes medication as recommended to someone who knows better or is an expert, and with the permission of Allah SWT, the disease will disappear and healing will be obtained (Muflih, 2013). One of the verse quotes about the decline of the disease and the cure: "Indeed, Allah sent down the disease and its cure. And Allah makes medicine for every disease. So seek treatment, but do not seek treatment with something that is haram." (HR. Abud Dawud).

From the quote above, Allah SWT will bring down the disease and also a cure to heal His people. People who are sick are encouraged to try or make efforts to get medicine for their recovery. Get medicine with all lawful things, and keep away from everything that is haram. We can find that during the time of the Prophet Muhammad, the management of disease was primarily based on the cause of the disease and efforts to find out how to deal with it. Muslims are encouraged to study the symptoms, causes, and further healing efforts (Nurhayati, 2016).

It can be concluded that the *Leptospira* bacteria are living things on this earth that are not visible to the naked eye. Despite its small size, the *Leptospira* bacteria can cause leptospirosis in an infected person. Pain is one of the tests or trials that Allah SWT has given to His servants. All the diseases that Allah SWT sent down, He also sent down medicine for the healing of His people.

### Urine According to Islamic View

The definition of urine according to KBBI is waste liquid that accumulates in the bladder and is excreted from the body through the urinary tract. The scholars agree (ijma ') that urine (urine) is unclean, including the urine of a baby, whether it is a boy or a girl. However, sharia provides convenience and relief on how to clean it (Faiz, 2018). Rasulullah SAW said: "Clean yourself from peeing. Because most of the grave torture comes from the pee marks." (Reported by Ad-Daruquthni).

The urine of newborn girls is categorized as najis mutawassithah, while the urine of boys is unclean mukhaffafah. Unclean mutawassithah is human or animal feces, urine, pus, blood, carcasses (other than fish, grasshoppers, human corpses), as well as other unclean things, apart from those mentioned in light or severe najis. Najis mutawassithah is classified into moderate najis, the way to clean it must be washed, so that the smell, color, and taste are lost. Unclean mukhaffafah is mildly unclean, where the way to purify it is to sprinkle clean water on the unclean object (Pertiwi, 2017 & Hasanah, 2011). One of the verses related to purifying from unclean is: "Indeed, Allah loves those who repent and loves those who purify themselves." (QS. Al-Baqarah [2]:222).

As has been explained in the verse, Allah SWT advises his people to always purify themselves from impurity such as urine (urine), because urine is not a tayyibat (a good thing). However, Allah SWT will not create something useless. All creation of Allah SWT has a purpose and purpose in it. As quoted from the Qur'anic verse regarding all of His creations: "We did not create the heavens and the earth and what is between them but with the correct (purpose) and within the appointed time. And those who disbelieve turn away from what has warned them." (Surah Al-Ahqaf [46]: 3). Allah SWT also said: "He is Allah, Who made everything on earth for you and He willed (created) the heavens, then He made the seven heavens. And He Knows all things." (Surah Al-Baqarah [2]: 29).

### Identification of Leptospira Bacteria in Human Urine According to Islamic View

Leptospirosis is a public health problem that exists throughout the world, especially in countries with tropical and sub-tropical climates, including Indonesia which has high rainfall. This is coupled with unhealthy environmental conditions such as when there is a flood, which is a place for the survival and breeding of Leptospira bacteria (Prihantoro T & Siwiendayanti A, 2017). In making a diagnosis of leptospirosis, a molecular examination using medical science technology is needed on a person's blood or urine sample to determine whether the individual is infected with Leptospira bacteria or not.

In this connection, Islam regulates through the nature of masalah mursalah. Where masalah mursalah is the benefit of something good according to reason, with the consideration that it can manifest goodness (benefit) or avoid badness (fading) for humans. According to Zakî al-Dîn Sya'bân, he views that masalah mursalah is one of the important and significant foundations of the Islamic law that makes it possible to produce virtuous values (Rusfi, 2014). One of the verses of the Al-Qur'an relating to benefit: "They believe in Allah and the Last Day, encourage good and forbid evil, and race with one another in doing good. They are 'truly' among the righteous." (Surah Ali-Imran [3]: 114).

In the quotation of the verse, Allah SWT instructs His people to hasten to do good and prohibits doing badly. Related to this, we are obliged to be able to do good and be useful for many people. One way is to use the knowledge we have, to be able to help people who are sick, in this case, leptospirosis, to establish a definite diagnosis and treat according to the condition of the sick person.

### Conclusion

Based on the various explanations above, it can be concluded that the identification of Leptospira bacteria in human urine is

permissible according to the Islamic perspective. This is in accordance with what is in the Qur'an, that Allah SWT has signaled the importance of knowledge and made the process of searching for it a form of worship. Apart from that, the Qur'an also emphasizes that the only source of knowledge is Allah SWT. Thus, in the view of the Al-Qur'an, science, and religion are two things that are integrated and interconnected to the benefit of His people.

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