

The Process of Rapid Eye Movement (REM) Sleep in the Qur'an: Neuroscience Perspective on the QS. Al-Kahfi 18.

Proses Tidur Gerak Mata Cepat (Rapid Eye Movement) dalam Al-Qur'an: Perspektif Neurosains terhadap QS. Al-Kahfi 18

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Abstract

This study aims to understand the scientific concept of sleep in the Qur'an by using data interpretation of QS. Al-Kahfi 18, which is collaborated with neuroscience. The phenomenon of sleep in the story of Ashabul Kahfi is found in QS Al-Kahfi 18. Classical scholars interpreted the verse especially in words *aiqazhan wa hum ruqud*, meaning that they slept even though many thought they were awake. This interpretation tends to be interpreted as a supernatural phenomenon, whereas in science, such events are paradoxical, which is a phenomenon of open eyes during sleep. This research is qualitative research by utilizing the interpretation of QS. Al-Kahfi 18 and has collaborated with neuroscience. The results of this study showed that the phenomenon of *aiqazhan wa hum ruqud* in QS Al-Kahfi 18 or between waking and sleeping in neuroscience perspective is a the process of REM (Rapid Eye Movement). Based on a neuroscience the word *aiqazhan* can be interpreted with the meaning of unsleeping in the phenomenon of rapid eye movement. That is loss of consciousness and control over the body so that it can move unnoticed. It is illustrated in the story of Ashabul Kahfi in QS. Al-Kahfi 18. They fall asleep hundreds of years in the cave, while their eyes open while asleep, and their bodies move to the right and the left. Anyone who sees it will think they are awake, whereas the phenomenon is the body's reaction to the rapid eye movement phase in the sleep cycle.

Keywords: Surah Al-Kafi 18, Tafseer, Sleep, Rapid Eye Movement. Neurosciences

Abstrak

Penelitian ini bertujuan untuk memahami konsep ilmiah tidur dalam Al-Qur'an dengan menggunakan data penafsiran terhadap QS. Al-Kahfi 18 yang dikomparasikan dengan ilmu neurosains. Fenomena tidur dalam kisah Ashabul Kahfi terdapat pada QS Al-Kahfi 18. Para ulama klasik menafsirkan surat tersebut khususnya pada lafadz *aiqazhan wa hum ruqud* dengan makna bahwa sebenarnya mereka tidur meskipun banyak yang mengira mereka bangun. Penafsiran seperti ini cenderung dimaknai sebagai fenomena supranatural padahal dalam ilmu sains kejadian seperti itu disebut paradoxial yaitu sebuah fenomena mata terbuka saat tidur. Penelitian ini merupakan penelitian kualitatif dengan memanfaatkan penafsiran terhadap QS. Al-Kahfi 18 dan dikomparasikan dengan ilmu Neurosains. Hasil penelitian ini menunjukkan bahwa fenomena *aiqazhan wa hum ruqud* pada QS. Al-Kahfi 18 atau antara bangun dan tidur dalam perspektif neurosains merupakan fenomena REM (Rapid Eye Movement). Berdasarkan ilmu Neurosains tafsir kata *aiqazhan* bisa diartikan dengan makna terjaga atau dalam fenomena rapid eye movement hilangnya kesadaran dan kontrol atas tubuh, sehingga tubuh bisa bergerak tanpa disadari. Hal ini terilustrasikan pada kisah Ashabul Kahfi dalam QS. Al-Kahfi 18. Mereka tertidur ratusan tahun di dalam goa, sedangkan mata mereka terbuka saat tertidur dan badan mereka bergerak ke kanan dan ke kiri. siapapun yang melihatnya akan mengira mereka



sedang terbangun padahal fenomena tersebut merupakan reaksi tubuh atas fase rapid eye movement dalam siklus tidur.

Kata Kunci : Surah Al-Kahfi Ayat 18, Tafsir, Tidur, Gerak Mata Cepat. Neurosains

Introduction

Al-Kahf is the Surah of the Quran that tells a story of sleeping experienced by *Ashāb al-Kahf* that is often interpreted by some *mufasssirs* as a spiritual phenomenon. This is described by Quraish Shihab, in interpretation of words '*aiqadzun wa hum ruqud*' QS. Al-Kahf:18 as a deep sleep, "they are actually awake, as if their body is moved to make them undamaged and gets sunshine."¹ This interpretation is not able to answer the scientific question related to sleep phenomenon experienced by *Ashāb al-Kahf*. In fact, sleep phenomenon in science discourse has several terminologies and stages that might place the sleep phenomenon represented in Al-Kahf:18 as a stage of sleep terminology.

One of terminologies in sleep phenomena is REM (Rapid Eye Movement), a sleep phenomenon that makes people sleep with eyes open and moving body. Sleeping with eyes open is a phenomenon that might happen in human especially when someone is having a paradoxical phase. In this phase, the body has its similarities to wakefulness but actually sleeping. This can be seen through the pattern of EEG (Electroencephalogram) shown by people entering the paradoxical sleep. The EEG pattern shows that human entering the paradoxical sleep has similarities with the EEG patterns of wakefulness. The sleep pattern in paradoxical phase is signaled with a sudden reduction of muscle tone in the whole body. Muscles are experiencing total relaxation, except eye muscle. Therefore, paradoxical sleep is often called as Rapid Eye Movement (REM).²

The study about sleep phenomenon in Al-Kahf tends to be described as a supernatural phenomenon. Scientific perspective is ignored in the prior studies. Correspondingly, there are three patterns that can be mapped from the study regarding sleep phenomenon in Al-Kahf. First, the study attempts to explain and interpret Al-Kahf.³ Second, the study tried to present the concept of sleep in several

1 M. Quraish Shihab, *Tafsir Al-Misbah : Pesan, Kesan, Dan Keserasian Al-Qur'an*, 1st ed. (Jakarta: Lentera Hati, 2002), 259.

2 Medical Youth Research Club, "Did You Know?? Tidur Dengan Mata Terbuka? Berikut Penjelasannya." (accessed in 10 March 2021 <https://med.unhas.ac.id/myrc/2018/12/21/did-you-know-tidur-dengan-mata-terbuka-berikut-penjelasannya>).

3 Juan Hadi Yusuf, "Kisah Ashāb al-Kahf Pada Al-Qur'an Surah Al-Kahfi Ayat 9-26 : Studi Tafsir Muqaran Antara Tafsir Ilmi Karya Lajnah Pentashihan Mushaf Al-Qur'an Dan Tafsir Qur'an Karim Karya Mahmud Yunus Perspektif Human Hibernation" (June 9, 2021); Shihab, *Tafsir Al-Misbah : Pesan, Kesan, Dan Keserasian Al-Qur'an*; Hilmah Latif, "Melacak Alur Pemaparan Dan Fragmen Kisah Ashab Al-Kahfi Dalam Al-Qur'an" 4, no. 2 (December 14, 2016),

surah in Quran.⁴ Third, the study attempts to explain the phenomenon mentioned in science and Islam.⁵ From these three patterns, there is no study that focuses on science or specifically neuroscience to observe deeper the sleep phenomenon represented in Al-Kahf. In fact, sleep phenomenon in the story of *Ashāb al-Kahf* in Al-Kahf is part of scientific phenomenon that can be explained scientifically.

This research applied comparative analysis by using the data from a Quranic exegesis toward Al-Kahf:18 and neuroscience. The analytical method employed in this research is critical analysis. This method leads the researchers to find factual and accurate findings from the phenomenon or the relation of the phenomena being researched. This research discussed the meaning of *aiqazhan wa hum ruqud* in Al-Kahf:18 and Rapid Eye Movement (REM) as the sleeping phase. The descriptive analytical method can develop the wide, actual, and functional knowledge in daily lives. Therefore, this research also aims to expand the feature of *tafsir ilmi* that is based on the scientific phenomena.

This research shows that there is a harmony between Quran and science through neuroscience toward the interpretation of Al-Kahf:18. In neuroscience discourses, the phenomena of sleeping with eyes open are the sign that human is entering the paradoxical phase. This phase signalizes that human loses control over their body so that they move unconsciously. In the context of *Ashāb al-Kahf*'s story found in Al-Kahf:18, he experienced the paradoxical phase when that makes them move their body to the right and to the left even though they were asleep.

Sleep in the Neurosciences Perspective

Sleep is an active period in which a lot of important processing, restoration, and strengthening occurs. Exactly how this happens and why human bodies are programmed for such a long period of slumber is still somewhat of a mystery. But scientists do understand some of sleep's critical functions, and the reasons need it for optimal health and well being. One of the vital roles of sleep is to help us solidify and consolidate memories. As go about day, human brains take in an incredible amount of information. Rather than being directly logged and recorded, however, these facts

4 Syamsinar Syamsinar, "Pola Tidur Dalam Al-Qur'an (Sebuah Kajian Tafsir Tahlili QS.Al-Furqan/25: 47)" (Universitas Islam Negeri Alauddin Makassar, 2016); TIA NURMILAH LUBIS, "Tidur Dalam Al-Quran (Tinjauan Ilmu Kesehatan)" (Universitas Islam Negeri Sultan Syarif Kasim Riau, 2017); Ahmed S. BaHammam and David Gozal, "Qur'anic Insights into Sleep," *Nature and Science of Sleep* 4 (2012): 81–87. keadaan berhenti badan dan kesadarannya (biasanya dengan memejamkan mata

5 Farahwahida Mohd Yusof et al., "Sleep Phenomena from the Perspectives of Islam and Science," *Jurnal Teknologi (Sciences and Engineering)* 67, no. 1 (March 2014): 105–110; Andrew B. Newberg and Bruce Y. Lee, "The Neuroscientific Study of Religious and Spiritual Phenomena: Or Why God Doesn't Use Biostatistics," *Zygon* 40, no. 2 (June 2005): 469–490,

and experiences first need to be processed and stored; and many of these steps happen while human sleep. Overnight, bits and pieces of information are transferred from more tentative, short-term memory a process called “consolidation”. Researchers have also shown that after people sleep, they tend to retain information and perform better on memory tasks. Human bodies all require long periods of sleep in order to restore and rejuvenate, to grow muscle, repair tissue, and synthesize hormones.⁶

Healthy sleep is critical for everyone, since all need to retain information and learn skills to thrive in life. But this is likely part of the reason children who acquire language, social, and motor skills at a breathtaking pace throughout their development need more sleep than adults. While adults need 7-9 hours of sleep per night, one year olds need roughly 11 to 14 hours, school age children between 8 and 10. During these critical periods of growth and learning, younger people need a heavy dose of slumber for optimal development and alertness.⁷

Sleep is an unconscious state in which individual perceptions and reactions to the environment decrease or disappear, and can be awakened again with sufficient senses or stimuli. Sleep is a state of relative unconsciousness that is full of activity inactivity which is a sequence of cycles that are repeated each representing a different phase of brain and bodily activity. Sleep is characterized by minimal physical activity, varying levels of consciousness, changes in the body’s physiological processes and decreased response to external stimuli. visual, auditory, pain, and tactile sensory stimulation as well as emotional and thought processes.⁸

In essence, sleep can be classified into two categories, namely sleep with rapid eye movement (REM) or so-called paradox sleep, and sleep with slow eye movement (NREM) or known as slow wave sleep. NREM sleep NREM sleep is sleep that is comfortable and deep. In NREM sleep brain waves are slower than in people who are conscious or not sleeping. Signs of NREM sleep include: reduced dreams, a resting state, decreased blood pressure, decreased respiratory rate, decreased metabolism, and slow eyeball movement. NREM sleep has four stages as follows: (a) Stage 1, this stage I is a transitional stage where a person switches from conscious to sleep. At this stage, it is marked by a person who tends to relax, still aware of his environment. A person sleeping at this stage I can be easily awakened. Normally, this stage lasts a few minutes and constitutes 5% of total sleep. (b) Phase II, the individual enters

6 Andy R. Eugene and Jolanta Masiak, “The Neuroprotective Aspects of Sleep,” *MEDtube science* 3, no. 1 (March 2015): 35,

7 SleepFoundation.org, *Why Do We Need Sleep*. (<https://sleepfoundation.org>. Access in 29 November 2019).

8 K.A.Tri Widhiyanti, “Pemberian Back Massage Durasi 60 Menit Dan 30 Menit Meningkatkan Kualitas Tidur Padamahasiswa Vi A Penjaskesrek Fpok Ikip Pgri Bali Semester Genap Tahun 2016/2017,” *Jurnal Pendidikan Kesehatan Rekreasi* 3, no. 1 (2017): 10., Vol. 3, No.1, 2017. p. 10.

the sleep stage, but can still wake up easily. Muscles begin to relax. Normally, this stage lasts 10-20 minutes and constitutes 50% -55% of total sleep. (c) Stage III, is the beginning of the deep sleep stage. Deep sleep, complete muscle relaxation and the individual tends to be difficult to wake up. This stage lasts for 15-30 minutes and is 10% of total sleep. (d) Stage IV, stage IV is a stage of sleep where a person is in a deep sleep stage or delta sleep. A person becomes difficult to wake up so he needs a stimulus. Physiological changes occur, namely: EEG brain waves weaken, pulse and respiration decreases, blood pressure decreases, muscle tone decreases, metabolism slows down, body temperature decreases. This stage is 10% of total sleep⁹.

REM sleep REM sleep is sleep in an active or paradoxical state. REM sleep is characterized by: (a) usually accompanied by active dreams, (b) more difficult to wake up than during deep slow-wave sleep, (c) muscle tone during deep sleep is very depressed, slow waves, spinal projections of the activating reticular system, (d) The frequency of the heart and breathing becomes irregular, (e) In the peripheral muscles there are some irregular muscle movements, (f) The eyes quickly close and open, the pulse is fast and irregular, blood pressure increases or fluctuates, gastric secretion increases and metabolism increases, (g) Sleep is important for mental and emotional balance, it also plays a role in learning, memory and adaptation. The symptoms that can be seen when experiencing REM sleep loss are tend to be hyperactive, lack of self-control and emotions, increased appetite, confusion, and suspicion. REM sleep usually occurs every 90 minutes lasting 5-30 minutes. During REM sleep, the brain tends to be active and its metabolism increases by 20%.¹⁰

Sleep in the Islamic Perspective

The word sleep in Arabic is defined as a translation of the word *نوما - ينام* - *نام* - which means sleep, drowsiness or rest. The word sleep has synonyms with the word *al-Muntaji* (lying down), *al-Ruqud* (staying), *al-Sinah* and *al-Nu'as* (sleepy).¹¹ Al-Qur'an has mentioned several times about sleep. Sleeping in the Al-Qur'an is written through several words in arabic such as *نوم*. *Noum* is an Arabic word for sleep. The word of *Noum* and its derivatives are presented several times in the Al-Qur'an. In Al-Baqarah verses 155, Al-Furqaan verses 47, An Naba verses 9, Al-A'raaf verses 47, As Saffat verses 102, Al-Anfaal verses 43, Ar-Room verses 30, Az Zumar verses

9 Hirshkowitz M, "Normal Human Sleep: An Overview," *The Medical clinics of North America* 88, no. 3 (May 2004): 551-565,

10 Pierre-Hervé Luppi et al., "Brainstem Mechanisms of Paradoxical (REM) Sleep Generation," *Pflügers Archiv - European Journal of Physiology* 2011 463:1 463, no. 1 (November 15, 2011): 43-52,

11 Kemenag RI, *Tafsir Al-Qur'an Tematik: Kesehatan Dalam Perspektif Al-Qur'an* (Jakarta: PT. Sinergi Pustaka Indonesia, 2012), 285.

42. In the Al-Qur'an, several Arabic words were used to describe the sleep which may be compatible with modern science definition. Therefore, we can describe sleep stage as *Sinab* (نعاس *Nu'ass* سنة), and *Hojoo* (هجووع), *Ruqood* (رقود) and *Subaat* (سبات).¹²

In the al-Qur'an, the use of terms with word from *naama* (نام) any 9 verses. Surah al-Baqarah verses 255, al-Furqan verses 47, an-Naba' verses 9, al-Araf verses 97, al-Qalam verses 19, as-Shaffat verses 102, al-Anfal verses 43, ar-Room verses 23, az-Zumar verses 42. And in the al-Qur'an word from *naama* repeated times, not all of these verses meaning sleep, but there is also a meaningful dream.¹³ The word (نعاس) is resting the body is sleepy and sometimes closes eyes to a short break.¹⁴ Imam al-Azhari argues in essence the word *nu'as* (نعاس) is drowsy, but not to sleep or close eyes when sitting. In the al-Qur'an the word *nu'as* (نعاس) is mentioned twice. In the al-Qur'an, the use of terms with word from *nu'as* any 2 verses. In Surah al-Anfal verses 11 and an-Naba' verses 9.¹⁵ *As-Sabt* means comfort, rest, calm and silence. The verb *sabata* means to rest. So, the meaning of the above verse is and We make your sleep a stop from moving and a rest for the body. *Subat* and sleep are not the same thing as was believed by earlier people. Sleep is not always accompanied by *subat*. *Subat* is different from sleep, both in terms of language, medical, scientific, as well as in terms of visible reality. Sleep functions for psychological rest, while *subat* functions for resting the body. Allah SWT. Pairing these two things, namely sleep and *subat* and making sleep as *subat*, which is for psychological rest and physical rest.

The word of *Hojoo* (هجووع), in the Arabic mean as little sleep. However, According to Adh-Dhariyat chapter verses 17, believers sleep very little and spend more hours of night asked forgiveness and worship. This word means night sleep. In the Al-An'am 60-61 Allah mentions the word death twice, namely the word "yatawaffakum" which is interpreted as the word 'sleep' in the above verse, also in the word "tawaffathu" which means "to be spared". This is about two kinds of death, which is temporary death and death forever. This is explained in verse az-Zumar verses 42. The word *al-Ruqud* means sleep in very long time. *Al-Ruqud* means sleep in In the al-Qur'an, the use of terms from *raqada* (رقد) repeated 2 times, namely from of *ruqud* (رقود) found in one place, namely Qs. Al-Kahf verses 18 and form *marqad* (مرقد) is also found in one place, namely in the Qs. Yasin verses 52.¹⁶

12 Mohammad Reza Heidari, Reza Norouzadeh, and Mohammad Abbasi, "Sleep in the Quran and Health Sciences," *Health, Spirituality and Medical Ethics* 1, no. 1 (2014): 30–36,

13 Muhammad Abd al-Baqi, *Al-Mu'djam Al-Muhfaras Li-Alfāz Al-Qur'ān Al-Karīm* (Cairo, 1987), 728.

14 Muhamad bin Mukrim Ibnu Mandzur, *Lisan Al-'Arab* (Bairut: Dar Shadir, 1999), 361.

15 al-Baqi, *Al-Mu'djam Al-Muhfaras Li-Alfāz Al-Qur'ān Al-Karīm*, 707.

16 Ibid., 323.

QS. Al-Kahfi 18 in the Qur'anic Exegesis

Thantawi Jawhari in his exegesis book entitled *Tafsir Al-Jawahir fi Tafsir Al-Karim* stated that *wa tahsabuhum aiqazhan* means “You see them as if they are awake because their eyes are open when sleeping,” *wa nuqallibuhum dzaatal yamiini wa dzaata syimaal*, “ and their body is move to the left and to the right to make the earth not damage their body.”¹⁷ This interpretation is similar to what Ibnu Katshir has in his exegesis book. He also added the story of Ibnu Abbas that stated, “If they were not moved, they would be eaten by termite.”¹⁸

Hamka in Al-Azhar exegesis book interpret *aiqazhan* with ‘awake’. *Ashāb al-Kahf* in their sleep was guarded by Allah to avoid their body from damage. Hamka did not use the meaning ‘awake’ as other previous *mufassirs* had done. He thinks it is impossible for human to get up and do the activities when they are falling asleep. The word ‘wakefulness’ can be interpreted as wake up after fainting or after sleeping, so it is in line with the word ‘sleep’ and ‘wake up’. People who intentionally is not sleeping all night long is called ‘awake’. As what Ibnu Abbas stated, their eyes are open, and from afar they look like awake, even though they are actually sleeping. We moved to the left and to the right so that the blood in their body flows well and has not blood clots in their veins and is not dissolved into the earth.¹⁹

The Story of *Ashāb al-Kahf* in Al-Kahf

Imam Fakhrudin al-Razi, in his exegesis book *Mafatihul Ghaib* in relation to the interpretation of Al-Kahf:18 which stated, “the *mufassirs* have opinion about the pronunciation of “*fadhrabna ala adhanihim*” which means “We made them sleeping”. Some Muslim scholars said that the sentence means Allah SWT closed their hearing or created a blockage between sense of hearing and reality around them so they could not hear any sound that can wake them up.”²⁰ This interpretation has strong a connection with phenomenon of *Ashāb al-Kahf* who had been sleeping for hundreds of years.

The story of *Ashāb al-Kahf* had been known widely among Muslims as an extraordinary event. This event is stated in Al-Kahf:9-26. *Ashāb al-Kahf* are the firm believers of monotheism teachings, a teaching that only believes in Allah SWT as a God that deserves to be worshipped. Besides, they also glorify Allah SWT as the ruler of sky and land. They hide in a cave because they run away from the cruelty

17 Thantawi Jauhari, *Al-Jawahir Fi Tafsir Al-Qur'an Al Karim* (Beirut: Dar Al-Fikr, 1974), 125.

18 Muhammad Nasib Rifa'i, *Ringkasan Tafsir Ibnu Katsir*, 3rd ed. (Jakarta: Gema Insani, 2012), 187.

19 Hamka, *Tafsir Al-Azhar* (Jakarta: PT Citra Serumpun Padi, 2007), 178.

20 Fakhr al-Din Ar-Razi, *Mafatih Al-Ghaib* (Beirut: Dar al-Kutub al-Ilmiyah, 2015), Vol 21 74.

of King Dikyanus. During their hiding, they experience a unique phenomenon. Those seven religious youths had been sleeping for 309 Hijri years or 300 AD.²¹ This phenomenon, in several decades, is believed as a supernatural phenomenon. Whereas, this phenomenon can be explained in scientific way. There are some things that can be explained in scientific way from the story of *Ashāb al-Kahf* in Al-Kahf:18.

The first, in the sleeping process of *Ashāb al-Kahf*, they start with closing their ears. It can be seen in Al Kahf:11. The sense of hearing has a great impact in connection with sleep activity of living creatures. What it means by sense of hearing is the part of body organ that interacts with sound, then changes the sound into electrical vibration that can be caught by central of hearing nerve inside the brain. Blockage of hearing of *Ashāb al-Kahf* when sleeping allows their brain's work to be apart from sound impact that can wake them, so they can sleep for hundreds of years.

The second, it allows youths to sleep in a very long period because God deactivates reticular system in their brain tissue. This system is connected to hearing nerve tissue that has two functions, they are hearing system and balancing system, both inside and outside our body. When Allah SWT said, "so, we close their ears". It means that God closes both functions at once, hearing and balancing. Therefore, body balancing system which is found in inner part of ears can trigger the activity of all nerves and other body functions. Meanwhile, because God closes their ears, all of these functions cannot work so they can sleep profoundly as if they are separated from the world.

The third, what makes *Ashāb al-Kahf* can live in a very long sleep is because Allah SWT protects their body from destruction. Al-Kahf:18:

"And you would have thought them awake, whereas they were asleep. And We turned them on their right and on their left sides, and their dog stretching forth his two forelegs at the entrance {of the Cave in the space near to the entrance of the Cave (as a guard at the gate)}. Had you happened upon them, you would certainly have turned back from them in flight, and would certainly have been filled with awe of them."

The verse above is related to *Ashāb al-Kahf* who have been sleeping for hundreds of years and their bodies move from one side to another. It can be seen on "and we turned them on their right and on their left sides,". It proves that body reposition happens during their long sleep period. The change of body position and body movement has a great impact toward the protection of their body from destruction. Ibnu Abbas said: "if they do not turn over, the soil will eat them".²²

Modern scientists tried to expose sleeping phenomena which are identical

21 Khalid Abdul Mu'thi Khalif, *Nasihat Untuk Orang-Orang Lalai* (Jakarta: Gema Insani, 2005), 107.

22 Ibnu Katsir, *Tafsir Al Qur'an Al 'Adhim Al Musamma Tafsir Ibnu Katsir* (Libanon: Maktabah Al Rusydi,

with *Asbāb al-Kahf* phenomenon. In 1940, Ernest Kretschmer, Bryan Jennet, and also American scientist Fred Plum mentioned that phenomenon as a vegetative condition or comma. In medical world, comma is an unconscious condition where a person cannot respond external stimulus. In a very deep comma, respiratory system does not work so a patient has to be supported with mechanical respiratory instrument (artificial respiration) to breathe. Comma can continue for several days, or in very rare cases, for years. Usually, when a person has been in comma for a month, the situation will continue for years. The most severe comma is when patient's brain does not have electrical activity detected. Comma can be stated as dead-brain syndrome. Comma can happen because of the decline of metabolism activity in the brain, which may be caused by brain disorder, brain inflammation because of meningitis or encephalitis, medicine overdose, the lack of oxygen, or abnormal metabolism.²³

The Process of Rapid Eye Movement (REM) While Sleeping in Al-Kahfi:18

Studies related to phenomena of sleeping have increased in early 20th century. Especially, after the invention of electroencephalography (EEG) instrument by a German scientist, Hans Berger. The way this instrument works is by counting nerve system activities using electrical current, just like the way some instruments that are used to count the activity of heart, muscles, and other body parts. That is why, it is possible to determine nerve system activity in awake and sleeping condition by recording electrical current in brain, eyes, and muscles.²⁴

Electroencephalography (EEG) instrument reveals that when a person sleeps, alpha waves change and are recorded in the form of special ribbon graphic. They travel at a speed of 10 waves per second when awake. However, during sleeping period, the waves disappear and are replaced by smaller and faster waves. When they enter deeper phase, waves change into bigger but slower, waves. Through these waves, scientist can divide sleeping phase into five phases or stages. Recording of electrical wave movement gives us sleep information. EEG records and records the movement of electrical current wave in the brain. EOG records electrical current comes from their eye movement. Meanwhile, EMG records the current that shows muscle tension level.

2011).

23 A A Howsepian, "Philosophical Reflections on Coma," *The Review of Metaphysics* 47, no. 4 (August 4, 1994): 735–755, <http://www.jstor.org/stable/20129576>.

24 James L. Stone and John R. Hughes, "Early History of Electroencephalography and Establishment of the American Clinical Neurophysiology Society," *Journal of Clinical Neurophysiology* 30, no. 1 (February 2013): 28–44.

First stage of sleep is the transition of awake and sleep. Alpha waves disappear and are replaced by faster small waves. EEG records that there are unorganized waves which show that eye is still moving. Recording instrument also records fast waves that show muscle tension. Recording instrument records slightly bigger waves interspersed by some fast waves. Muscle tension decreased, except for people who do not change their position from one side to another. Meanwhile, eye movement fades for a moment and calm itself. When a person enters second stage, he/she enters the state of true sleep. Second stage of sleep is the longest because it needs more than a half of total sleep time. This is one of miracles of creation because at this stage, sleep changes position on bed. It gives the skin a chance to rest, and it does not have constant pressure on one side of the body for a long period of time. On the third stage of sleep, sleep becomes deeper and deeper. EEG instrument records wider, higher, and slower ribbons compared to all previous waves. It is called delta wave, that is 1 to 4 per second. This wave occupies less than a half wave. On the fourth stage of sleep, delta wave increases its quantity into more than half of the wave. If the amount of delta wave increases into more than half of the wave, it means that sleep has already entered the fourth stage. Meanwhile, on the fifth stage of sleep, muscle tension really disappears. EEG also records rapid eye movement. On normal human, this stage only happens in a short period, not more than several minutes. Subsequently, a person who sleeps will return to the second stage, then to the third stage, and the fourth stage. So, a sleep enters another new cycle. In one night, a person who sleeps can experience four or five cycles of sleep.

The process of rapid eye movement has caught the attention of scientists. Moreover, there are some scientists who have divided four stages of sleep into two sections. The first section consists of four early stages of sleep and they call it sleep without rapid eye movement. This section takes about ninety minutes. The second section is the fifth stage of sleep. They call it rapid eye movement. This section only takes several minutes.

It should be noted that the first four stages come with fluctuate muscle tension. That is why, body changes its position on bed. These are phases that proceed sequentially without certain separations in between. The fifth stage is the stage with rapid eye movement sleep, and muscle tension really disappears. In 1952, scientists observe slow wave that is recorded with electroencephalography (EEG) instrument and shows rotating eye movement in early sleep. It encourages scientists to use the data of eye movement when sleeping. Scientists are amazed when looking at the changes of eye movement that happens in each sleep and the phase increases into a deeper stage. They observe the stage of rapid eye movement sleep. Research shows

that when people who are sleeping in this stage get woken up, they will feel that all activities they have been done are a dream and that dream can control human body movement. However, some scientists believe that a dream happens outside the stage of rapid eye movement. It shows that the correlation between rapid eye movement and a dream sleep is strong enough.²⁵

Talking about rapid eye movement phenomenon, we return to the historical story of *Ashāb al-Kahf* who slept for hundreds of years inside a cave. The phenomenon experienced by *Ashāb al-Kahf* is the process of rapid eye movement sleep with long duration. It means that, even if they slept for a very long time inside a cave, their bodies are not consumed by the soil, because even when in sleeping position, human body can move according to what he/she had experienced in the stage of rapid eye movement sleep. It is in accordance with what has been described by Al-Kahf:18 that they are sleeping but looks like awaken because their eyes are open. Just like what Allah SWT said in that verse.

Meaning : “And you would have thought they were awake,¹ though they were asleep. We turned them over, to the right and left, while their dog stretched his forelegs at the entrance. Had you looked at them, you would have certainly fled away from them, filled with horror”.

In the explanation of this verse, Ibnu Katsir, Fakhrudin Ar-Razi and Tantawi Jauhari in their exegesis mentioned that the condition of *Ashāb al-Kahf* inside the cave is like they are awaken with the sign of open eyes and body movement to the right and to the left. As if they are awake, when in fact, they are sleeping.²⁶ This explanation is supported by Hamka’s explanation in his exegesis book by interpreting the pronunciation of *aiqodzōn* with the meaning awake, not wake up.²⁷ With this meaning, it is possible that the condition of *Ashāb al-Kahf* who look like conscious but in fact sleeping, is an effort of Allah SWT to protect their bodies from destruction by moving their bodies from one side to another. Hamka does not use the word wake up, because the word “wake up” can mean wake from a sleep and then stand up. We also do not interpret it as conscious, because the word conscious can mean being conscious from unconscious condition.²⁸

Based on the interpretation by *mufasssirs* from classical period into modern period who stated that the words *aiqazhan wa hum ruqud* is interpreted as their

25 Ahmad Syauqi, *Kitab Rabasia Tidur Menurut Al-Quran, Sunnah Dan Sains Modern*, ed. Misbahul Ulum & Erik Erfinanto (Jakarta Selatan: Tuross Khazanah Pustaka Islam, 2018), 97.

26 Jauhari, *Al Jawahir Fi Tafsir Al-Qur’an Al Karim*, 125.

27 Hamka, *Tafsir Al-Azhar*.

28 Ibid., 178.

eyes are still awake even if they are sleeping. The phenomenon of open eyes in a sleep is known as paradoxal sleep phenomenon and it is related with the cycle of rapid eye movement sleep. Rapid eye movement is not only a part of sleep cycles, in the context of *Ashāb al-Kahf*' story, rapid eye movement sleep becomes a scientific explanation related to their condition during their sleep, as explained in Al-Kahf:18. *Ashāb al-Kahf*, in reality, do not experience supernatural state but they experience sleep phenomenon in a stage of rapid eye movement. This stage allows *Ashāb al-Kahf* to be protected from body damage by moving their bodies while sleeping. It happens because in the stage of rapid eye movement, *Ashāb al-Kahf* lose control of their bodies, movements that they have done are more due to recorded memories in their awake condition. That is why, when they wake up from their long sleep, they feel that what they have experienced is a dream.

The word being used in this verse, Al-Kahf:18, is "Ruqud". This word is not commonly used when referring to normal sleep; Al-Qur'an tends to use the word "Na'um" when referring to normal sleep. The use of word "ruqud" shows that the condition experienced by *Ashāb al-Kahf* is not a phenomenon of normal sleep and in a long period of time biologically. Meanwhile, the relevance with neuroscience is the word "aiqazhan" as if they are awake even if their eyes are open, has interconnection with rapid eye movement.

Conclusion

Muslim scholars have agreed to interpret the pronunciation *aiqazhan wa hum ruqud* in Al-Kahf:18 about the story of *Ashāb al-Kahf* who slept for hundreds of years, that they think they are awake because their eyes are open even though they are sleeping. Since the classical era, scientific exegesis has shown their existence until it is developed into contemporary period. Basically, the exegesis above shows them the signs and verses in His creation. Therefore, in the 20th century, it is proven by neuroscience. Open eye in a sleep is called paradoxal and it has scientific purpose. That is, when the eyes open and you can see the eyes moving in a sleep, here is where the phenomenon of rapid eye movement happens in sleep cycle is mentioned. So, when a person is awake during this cycle, he/she will tell when he/she wakes up from a sleep that he/she has a dream.

Comparative method used in this research can find exegesis problematic behind the sleep phenomenon of *Ashāb al-Kahf*. *Ashāb al-Kahf* in Al-Kahf:18 do not experience supernatural condition, just like what is being explained by mufassirs, but they experience sleep stage, which in neuroscience term is called as REM atau *rapid eye movement*. Sleep stage of REM allows a person to keep moving even in an

unconscious condition. It is described in the story of *Ashāb al-Kahf*, that their bodies move from right to left. As the result of the study, comparative method provided an alternative interpretation of the word *Aiqodhon* by giving the meaning of “awake” not “wake up” which has implications for scientific explanations based on neuroscience

Other aspects in this study, for example socio-political aspect in *Al-Kahf*, is basically a study that is rarely discussed by researchers. It gives a chance to other researchers to conduct deeper studies toward thematic study of *Al-Kahf*, so other aspects like social, cultural, and politic which are mentioned in this study are worth for in-depth study.

Supplementary Materials

The data presented in this study are available in [insert article or supplementary material here] (Usually the datasets were analyzed from library research can be found in the whole data references).

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Authors' contributions

All listed authors contribute to this article. R.K.K. wrote the original draft, reviewed and edited it, conceptualised the study and managed the project administration. A.N. was responsible for the methodology and validation, wrote the formal analysis and compiled the resources. R.W. wrote the visualisation and supervised the project.

Data availability statement

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of interests

None of the authors of this study has a financial or personal relationship with other people that could inappropriately influence or bias the content of the study.

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