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Sudden Death in an Elderly Indonesian Hajj Pilgrim: A Case Report

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ABSTRACT

There are 37% of Indonesian pilgrims in 2024 are elderly people aged ≥ 60 years. The elderly are a high-risk group for conditions such nocturnal disordered breathing, including Obstructive Sleep Apnea (OSA) especially severe physical fatigue in Hajj pilgrims. This descriptive case report concerns the death of an elderly hajj pilgrim in hotel. The data was collected from August to December 2025. It was obtained from the medical records of group's Hajj medical team and interviews with the pilgrim's roommate in Mekkah and her family in Indonesia. A 76-year-old female pilgrim with cardiovascular history was known without breathing while sleeping. She complained of fever, dizziness, and mild cough three days earlier. She received medical care from the medical team and her condition improved. That night, her roommate heard loud snoring followed by breathing sound gone while she slept. The medical team activated code blue and the Saudi Arabian emergency team declared that she died. In the medical check-up of Hajj pilgrims, screening of risk factor for suspected OSA needs to be done by health hajj management. The STOP-BANG questionnaire can be used to identify the high-risk of OSA in Hajj pilgrimage candidates. This can increase clinical awareness and mitigate the risk of death of Hajj pilgrims in hotels.

Keywords: Elderly; sleep apnea; screening

INTRODUCTION

The Hajj pilgrimage is the largest mass gathering in the Muslim world. Each year, more than two million Muslims from the whole world gathering in one place. In 2024, Indonesia received a hajj quota of 241 pilgrims from the Saudi Arabian Ministry of Hajj or approximately 10% of the global Hajj population. Approximately 37% of Indonesian Hajj pilgrims are aged ≥ 60 years or elderly group (1,2).

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They are at higher risk of health problems during the mass gathering activities of Hajj. The elderly pilgrims have an increased risks of health problems due to comorbidities, including cardiovascular, respiratory, and metabolic disorders. Other potential risks include sleep-related breathing disorders such as Obstructive Sleep Apnea (OSA), which can lead to sudden death (3–5). The assessment of the risk of death associated with OSA is not part of the standard health screening for Hajj pilgrimage candidates (6).

Obstructive sleep apnea is often associated with the risk of sudden death during sleep, while breathing can stop suddenly and decrease the blood oxygen levels. OSA occurs often frequently in men, increased with age, associated with hypertension and cardiovascular history, and obesity (3,7,8). This indicates that OSA associated with cardiovascular system, respiratory system, central and autonomic nervus system including mental health. OSA interacts with the cardiovascular system through conditions such as arrhythmias, atrial fibrillation, and myocardial infarction that cause total apnea (9–11). The common symptoms suggestive of OSA include loud snoring during sleeping, excessive sleepiness in day, severe physical fatigue, impaired cognitive, anxiety, and depression (9,12).

Hajj is a mandatory worship for Muslims who qualify the requirements of ability (*istitha'ah*), including financial capacity, physical capability and good health. The health status of Hajj pilgrimage candidates is regulated by the government and determined by the Hajj health officer at Community Health Center (*Puskesmas*). There are three stages of medical check-up for Indonesian Hajj pilgrimage candidates before departure. These regulations are outlined in the Permenkes RI No.15 of 2016 concerning the Implementation of Indonesian Hajj Health. However, screening for obstructive sleep apnea has not yet become an instrument for health examinations for Hajj pilgrims (14,15).

Therefore, it is crucial to report the case of sudden death among Hajj pilgrims for evaluating the implementation of Hajj health services in Indonesia. Screening for OSA among Hajj pilgrimage candidates should be included into pre-departure health examinations. This report describes a case of sudden death in an elderly Hajj pilgrim with suspected OSA and study the implications of clinical aspects and Hajj health management aspects.

METHOD

This article reports the case of death of a Hajj pilgrim in a hotel in Saudi Arabia in 2024. The report is based on clinical observation directly by group's Hajj medical team. The data was collected from August to December 2025. It was obtained retrospectively from medical record of pilgrim including period from illness to death, including anamnesis, medical history, physical examination, and previous supporting examinations. The qualitative data were obtained through structured interviews with roommates and family members in Indonesia. The diagnosis was established based on clinical suspicion regarding the pilgrim cause of death. The treatment was provided according to medical service standards and patient responses that were monitored periodically and recorded in the medical records.

All clinical data were analyzed descriptively to describe the patient's clinical course, therapeutic response, and outcomes. The patient identity was kept confidential in accordance with the ethical principles of medical research. The medical approval was obtained from the patient's family and health care provider. This article has received ethical approval from the Ethics Committee with number KEPKK/FK/086/08/2025.

RESULT

This sudden death case involved a female pilgrim, Mrs. Y, 76 years old, who was part of the regular Hajj Group X. This Hajj pilgrim had a medical history of atrial fibrillation (I48), anemia (D64.9), and chronic bronchitis (J40). From medical examination before Hajj departure, these Hajj pilgrims were declared to be *istitha'ah*. The screening did not identify the risk of sleep-disordered breathing or obstructive sleep apnea. Mrs. Y actively participated in the Hajj pilgrimage including the peak phase of Armuzna (Arafaah-Muzdalifah-Mina) on June 14th to 19th, 2024. In this phase, the pilgrimage was forced to be in mass gathering conditions with heavy physical activity, mobilization from one location to another, exposure to extreme temperatures and weather, and disturbed sleep patterns. Subsequently, Mrs. Y faced symptoms and the group's medical team was called to provide medical care.

Table 1. Clinical Timeline of Female Hajj Pilgrim, Mrs. Y, 75 Years Old

Time / Period	**Clinical Events**	
Day-3	Subjective:	Mrs. Y developed complaint of fever and headache
June 19th, 2024	Objective:	Blood pressure 110/90 mmHg, heart rate 88 bpm, respiratory rate 22 per minute, body temperature 38,1 ^{o}C, oxygen saturation 97%, and blood glucose index 126 mg/dL.
(04:00 pm)	Assessment:	Fever Unspecified (R50.9)
	Plan:	Paracetamol 500 mg per oral
Day-2	Subjective:	Mrs. Y developed cough and low appetite
June 20th, 2024	Objective:	Blood pressure 115/80 mmHg, heart rate 82 bpm, respiratory rate 22 per minute, body temperature 37,1 ^{o}C, and oxygen saturation 97%.
(08:00 pm)	Assessment:	Acute Respiratory Infection (J06.9), Anorexia (R63.0)
	Plan:	Bromhexine 8 mg, Entramix milk
Day-1	Subjective:	No complaints, cough gets better
June 21st, 2024	Objective:	Blood pressure 100/80 mmHg, heart rate 73 bpm, respiratory rate 22 per minute, body temperature 37,1 ^{o}C, and oxygen saturation 97%.
(11.00 am)	Assessment:	Acute Respiratory Infection (J06.9), Anorexia (R63.0)
	Plan:	Bromhexine 8 mg, plan to consult a pulmonologist tomorrow
The Day	02:00 am	Mrs. Y was seen going to the bathroom to urinate.
June 22nd, 2024	03.00 am	The patient was asleep, snoring loudly, as previously observed.
	03:30 am	No breathing sounds were heard, Code Blue was activated, and Advanced Cardiac Life Support was performed according to protocol.

04:00 am	The Saudi Emergency Medical Team (EMT) arrived and declared Mrs. Y dead.
04.40 am	The case was reported to Indonesian Hajj Health Clinic (KKHI) and then burial process was arranged.

Furthermore, death of Hajj pilgrim was reported as suspected sleep apnea (G47.30), suspected pneumonia (J18.9), and suspected pulmonary infection (J18.9). These diagnoses were not confirmed causes but were recorded as clinical considerations without no post-mortem examination or definitive diagnostic test.

DISCUSSION

In medicine, the death during sleep is often associated with underlying conditions such as heart disease, respiratory disorders, neurological conditions, and metabolic imbalances. The risk of sudden death increases in individuals with history of myocardial infarction, diabetes mellitus, and smoking behavior. Respiratory arrest during sleep can be also caused by OSA in which recurrent oxygen deficiency contributes to elevated the risk of cardiac arrest at night. It is characterized by loud snoring, choking episodes during sleep, and severe daytime sleepiness. Several studies have reported that mortality associated with OSA is often related to hypertension, coronary artery disease, left ventricular dysfunction, myocardial infarction, and arrhythmia, or known as Sudden Cardiac Death (SCD). This condition frequently occurs from midnight until morning or referred to as nocturnal sudden death (11,16,17). In this case, the Hajj pilgrim died at 04.40 am Arabian Standard Time.

Mrs. Y has risk factors such as prior episode of sleep apnea and a history of Atrial Fibrillation and Flutter. A meta-analysis involving 20,918 participants concluded that individuals with OSA and a history of atrial fibrillation had a higher risk of SCD (11). Another study reported that individuals with OSA have a cardiovascular mortality risk twice compared to those without OSA (17). This occurs due to the shift of intrathoracic pressure and hypoxia which increase afterload and transmural pressure in the heart. So that myocardial oxygen requirements increase and trigger subendocardial ischemia which leads to arrhythmia (17,18).

The recurrent episodes of respiratory arrest should be reported as a history that must be aware. During the medical examination, Hajj pilgrimage candidates should inform to health practitioners at Community Health Center (*Puskesmas*) or Hospital. So that, they will deliver the health status of Hajj pilgrimage candidates to medical team of flying group for supervision. However, sometimes Hajj pilgrimage candidates do not aware that they have OSA conditions. Therefore, screening of respiratory arrest during sleep is necessary to be implemented in medical examination. This information can be obtained from anyone who lives together (12,19).

Based on Hajj implementation report on 2023, the mortality rate of Hajj pilgrims were 774 peoples and become the highest incident of Hajj implementation in Indonesia (20). Therefore, the Indonesian Ministry of Religion issued a regulation about the obligation of medical examination for Hajj pilgrim's candidates in order to achieve the health *isthitha'ah* status before paying off the BIPIH (*Hajj Pilgrimage Costs*) (21). Medical examination for Hajj pilgrim candidates are implemented by the Indonesian Ministry of Health by assigning the Community Health Centers and Government Hospitals. In 2024, the types of medical examinations include general medical check-up, cognitive examination, mental health examination, and examinations for Activities Daily Living (ADL) independently (6).

In detail, the basic medical examinations include anamnesis, physical examination, laboratory, chest X-Ray, electrocardiography, and mental health examination using the *Self-Reporting Questionnaire* (SRQ)-20 as instrument. Furthermore, the advanced medical examinations are conducted to confirm the diagnosis, classification, and staging of diseases based on the results of basic medical examinations, such as COPD, emphysema, stroke, malignancies, heart failure, coronary heart disease, cardiomegaly, tuberculosis, and leg fractures. Cognitive examination aims to examine the thinking process of high-risk Hajj pilgrims using the *Mini Cog* and *Clock Drawing Test* (CDT4) instruments. Mental health examinations are conducted to assess the dementia and the power of orientation, memory, and concentration. This examination uses the *Abbreviated Mental Test* score (AMT) instrument. ADL examinations are conducted using the *Barthel Index* (6).

The mortality related to OSA must be aware that it frequently occurs during sleep. Medical examination must also include the screening of OSA for determining the health status of Hajj pilgrims. When we visited deceased's family, we received the information that patient often experienced the episodes of sleep apnea, but the detail could not be explained. The incident happened quickly then followed by return of breathing and going back to sleep.

There are some measuring tools to assess the severity of OSA. *Apnea-hypopnea index* (AHI) is a quantitative indicator often used by calculating the amount of apnea or occurrence of hypopnea divided by sleep hours. If calculated value shows AHI <5, a patient is not classified as OSA, if AHI 5-14 as mild OSA, if AHI 15-29 as moderate OSA, and if AHI > 29 as severe OSA. The sleep of OSA patients will have recorded using *polysomnography* (PSG). In addition, the severity of OSA also can be measured using *Respiratory Event Index* (REI), *Respiratory Disturbance Index* (RDI), and *Oxygen Desaturation Index* (ODI) (12,19,22).

There are some devices for OSA screening that is *Full Polysomnography* (PSG) or *Home Sleep Apnea Test* (HSAT). This is invasive device recording the physiological data to assess a apnea, hypopnea, body position, respiratory-event related arousals (RERAs), oxyhemoglobin saturation patterns, and parameters of sleep-state. Meanwhile, the *Heart Rate Variability* (HRV) is a non-invasive device used to assess autonomic modulation responses and adaptation to endogenous and exogenous stimuli. In addition, there are OSA screening instruments, including Berlin questionnaire, STOP-BANG

questionnaire, FOSQ (*Functional Outcomes of Sleep Questionnaire*), and NoSAS (*Neck, Obesity, Snoring, Age, Sex*) (12,23).

The polysomnography may not be available in some health facilities. The use of validated questionnaire will simplify the screening of risk-patients for assessment of Quality of Life (QOL) disorders. The International Consensus Statement on Obstructive Sleep Apnea declares that STOP-BANG questionnaire is the measuring instrument that most accurate for detecting all severity levels of OSA. The sensitivity and specificity of this questionnaire are the best and has Level of Effort (LOE) 1A (12,24).

This questionnaire has a high diagnostic accuracy, easy to use, concise, reliable, effective, and has a clear threshold for OSA stratification (25). Based on 47 studies with systematic review and meta-analysis that this questionnaire can be used in all geographic regions (26). Even in Indonesia, this questionnaire has been conducted validity and reliability test that the result is very good so that it can be implemented through cross-cultural adaptation in community health center or government hospital (27).

This article recommends that screening for OSA can be implemented for Hajj pilgrimage candidates, especially for elderly and with a history of cardiovascular disease. So that, the mortality due to OSA can be prevented in next years. Every health practitioner in community health center or government hospital is necessary given training about how to use STOP-Bang questionnaire for OSA screening in Hajj pilgrimage candidates. For the flying group medical team whose accompany Hajj pilgrims in Saudi Arabia, they are also necessary the history data about OSA risk and cardiovascular disease of their pilgrims.

CONCLUSION

In this case, the death of elderly Hajj pilgrims while sleeping at night was most likely associated with obstructive sleep apnea, which was exacerbated by comorbid cardiovascular disease, specifically atrial fibrillation and flutter. The excessive physical activities of Hajj pilgrims performed the risk factor that can increase significantly myocardial workload. Previous apnea episodes during sleep should be a concern in medical screening of Hajj pilgrimage candidates. The pre-departure medical examination should involve the identification of OSA risk, for example using the STOP-BANG questionnaire. This approach aims to enhance clinical awareness and enable early mitigation for mortality of Hajj pilgrims in hotels.

LIMITATIONS

This study has limitation that the diagnosis of OSA was not confirmed by polysomnography or validated screening before death. An autopsy was not performed to determine the etiology of cardiac arrest. Information about sleep-disordered breathing was obtained from interviews with the pilgrim's

roommate and the patient's immediate family. This case presents that OSA as suspected, not a definitive cause of death.

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