

Management of Chronic Diseases During the Hajj period

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Introduction

Every year, more than 2 million people worldwide perform a pilgrimage known as Hajj to the Kaaba, the “House of Allah”, in the sacred city of Mecca, Saudi Arabia. Hajj is one of the five pillars of Islam and is mandatory to perform at least once in a lifetime for all adult Muslims who can afford to make the pilgrimage and are in good health (1). In the Holy Quran, God commands Prophet Ibrahim to call people to perform the Hajj, “*And proclaim the Hajj to all the people: they will come to you on foot and on lean camels, coming from distant places*” (Surat Al-Hajj :27). The reward of Hajj is stated in one hadith, where Abu Hurairah reported that Prophet Mohammed (peace and blessings be upon him) said, “*The reward for a Hajj mabroor is nothing but Paradise*” (Al-Bukhari and Muslim).

Hajj takes place in the last month of the Islamic lunar calendar for a period of 5 days (2) and is considered to be one of the largest annual mass gatherings in the world. Despite the many benefits and rewards gained from Hajj, it can pose a public health concern.

The rise in population and proximity between pilgrims in addition to the intense Saudi Arabian heat can create perfect conditions for the spread of infectious diseases(3). Furthermore, pilgrims may encounter several challenges including access to adequate food, water, and sanitary facilities. However, the Saudi Ministry of Health (MOH) has taken certain measures to address such challenges. For instance, before each Hajj, a proactive public health strategy is launched with an emphasis on preventing and monitoring health risks and providing

medical care with the provision of safe water, food supplies and sanitation(1).

Nonetheless, Hajj can be very arduous with the population consisting of a significant elderly population many of whom have underlying medical issues(4). The environmental and physical strains in addition to changes in eating and sleeping patterns experienced during Hajj can lead to the exacerbations of non-communicable diseases (NCDs) such as cardiovascular disease (CVD), diabetes, and hypertension. This is important particularly if pilgrims forget to take their usual medication, reduced self-monitoring of blood pressure, blood glucose, and preventive health measures(5). Therefore, these NCDs and their associated complications pose a significant health risk during Hajj and are a leading cause of hospitalisation and mortality among pilgrims with extensively published data (3,5–8). However, data regarding nephrological or renal conditions amongst pilgrims is very limited.

Chronic Kidney disease is common and has the potential to worsen if the general health of patients deteriorates. In addition, many patients with CKD have renal replacement therapy (haemodialysis, peritoneal dialysis and renal transplantation), and have specific needs/precautions that they should follow when commencing hajj

Currently, literature is scarce regarding individuals with renal conditions who inquire about Islamic rituals such as Hajj. Therefore, this paper will aim to review the existing research and highlight what patients with renal conditions can do to safeguard their health when performing Hajj.

Hajj and Chronic kidney disease

Chronic kidney disease (CKD) affects approximately 8-16% of the population worldwide (9). It is defined by structural or functional abnormalities of the kidneys that have been present for ≥ 3 months and have an impact on health. It is described as albuminuria of ≥ 30 mg/24 hours, a glomerular filtration rate (GFR) of < 60 ml/min/1.73 m² or the presence of markers of kidney damage such as haematuria (10). The estimated GFR is classified from stages 1-5 (eGFR ≥ 90 mL/min, eGFR 60-90 mL/min, eGFR 30-60 mL/min, eGFR 15-30 mL/min, and eGFR < 15 mL/min respectively) (11). Albuminuria is also assigned into 3 categories: A1 < 3 mg/mmol, A2 3-30 mg/mmol and A3 > 30 mg/mmol. A higher stage signifies more severe renal disease for both eGFR and ACR.

Management of CKD involves identifying and treating the underlying cause, measures to delay decline in renal function, treating complications of CKD to maintain health and preparing for renal replacement therapy if renal function continues to decline despite appropriate measures.

Complications of CKD include hypertension, anaemia, acid-base abnormalities, cardiovascular disease, mineral bone disorder and volume overload (12). Patients with CKD should undergo assessment for these complications as they are thought to contribute to poor quality of life, high morbidity and mortality therefore should receive optimum treatment to reduce such risks.

Good hydration and avoiding extreme heat

During Hajj, temperatures can rise to 45°C which can lead to heatstroke and heat exhaustion (13). The strenuous physical rituals and limited enclosed spaces particularly in the desert during the day of Arafat, where pilgrims stand for long hours during the day may place individuals in danger of extreme heat exposure. With a higher daily temperature, the incidence of renal colic, renal failure and urinary tract infection increases (14). Dehydration and can lead to acute kidney injury (AKI) (15). The concurrent dehydration stress on these individuals could exacerbate their renal function further and lead to higher hospital admissions.

To help avoid this, water mist sprayers are often used especially in the desert, and it is recommended and permitted during Hajj to use umbrellas, perform some of the rituals at night, and have adequate fluid intake.

Hospitals also have specialised cooling systems for the treatment of heatstroke.

Infections and CKD – a special concern

A special concern during Hajj is the emergence of infectious diseases. The conditions of Hajj such as crowded accommodations, extreme temperatures, inadequately stored food, a global population and proximity between pilgrims during prayer and congregational encourage the transmission of infectious diseases particularly airborne pathogens (1). This is important as patients with CKD are at an increased risk of infection (16). Infections can lead to sepsis, which is associated with AKI, hospital admissions and increased mortality (17). It is also important to note, that although AKI is reversible, on a background of existing stable CKD, it can lead to progressive deterioration in renal function.

To minimise the health risks to pilgrims and to prevent the spread of communicable diseases in Hajj, the MOH outlines its regulations which pilgrims are required to meet including vaccinations. Sanitation, vector control, and the provision of safe water and food supplies are also the main public health initiatives at Hajj with continuous surveillance of the spread of several bacterial and viral pathogens done routinely.

Medication compliance and CKD – the importance of compliance, sick day rules and patient awareness

It is expected of pilgrims with chronic renal conditions to bring their usual medication with them during Hajj. However, the proper handling and storage of drugs during Hajj are difficult due to several factors, especially for pilgrims with chronic diseases who must take their medications regularly or for those who use medications that are temperature-sensitive and must be kept at cool or low temperatures. In CKD, medication compliance is a crucial element in effective disease management and this multi-pharmacological treatment may infer a substantial quantity of pill consumption. This makes managing multiple medications a challenging task, particularly since the Hajj pilgrimage entails long flights, a variety of outdoor physical tasks sometimes in extremely hot weather and travelling between holy sites which are often done by foot. It is also believed lack of education can lead to medication misuse (18). For instance, dehydration can pose a significant risk to individuals taking certain medications. Medications such as ACE inhibitors and

NSAIDs can worsen renal function and result in kidney failure if taken when dehydrated therefore should be temporarily stopped during a dehydrating illness (Sick day rules)(19).

Healthcare professionals should therefore pay attention to how religious services such as Hajj influences an individual's physical health. They are an important source of information in managing and controlling chronic diseases and their advice should be sought prior to undertaking Hajj. A suggestion may be for healthcare professions to train individuals suffering from chronic conditions in being compliant with their medication and visit healthcare facilities upon their return for a check-up. Additionally, there are also several public health measures set in place during Hajj including free healthcare to pilgrims and widespread healthcare education resources such as health education materials, travel agents, and media communication during Hajj, written in several languages.

Hajj and renal transplant patients

Renal transplantation is the best form of renal replacement therapy. The cornerstone of renal transplantation is systemic immune-suppression aimed at dampening down the host's immune response to reject the donor kidney. Immuno-suppressed individuals are at significant risk for contracting infections due to the risks associated with Hajj including fatigue, excessive physical exertion, and massive crowding. However, the impact of the Hajj on renal transplant patients has not been the subject of published research. General advice for such individuals is to get the meningococcal vaccine prior to travel (20) and to adhere to advice about pneumonia and influenza vaccinations (21). The MOH also issues guidelines for kidney patients including ensuring they carry the required prescribed medications and keep them in a location that is suitable and simple to reach(22). This is important as post-renal transplant patients are required to take immunosuppressive drugs to prevent organ rejection ; adherence is vital to ensure the transplanted kidney's longevity(23). Travellers who are immunocompromised should also consult with their primary care doctor and transplant specialists both pre- and post-departure and they must be prepared to offer guidance to this distinct group of travellers to assess and mitigate the risks associated with Hajj.

Hajj and dialysis patients

For patients undergoing dialysis who want to perform Hajj, the MOH has provided several free facilities for

haemodialysis. However, prior to leaving for Hajj, it is recommended to inform the renal physician at least a few months before travelling for them to provide advice regarding fitness for travel. It is also useful to inform the dialysis facility prior to travelling to give them sufficient time to compile all medical reports. Apart from these medical reports, it is also useful to bring viral serology reports, dialysis prescriptions, and a report from the GP stating all the prescribed medications. The MOH has fully equipped healthcare centres for haemodialysis and is working on coordinating several centres in different hospitals in Mecca and the holy sites based on the movements and ritual performance of pilgrims. Once the pilgrim has recorded their data in one of these kidney units, the MOH will try to schedule dialysis sessions for them and once this is done, available staff will guide pilgrims every time to the nearest kidney unit based on their movements(24). It is important to note the MOH has started a mobile dialysis service that can be used in accordance with requirements and standards during emergency transportation, inside pilgrim camps (if required) and in hospitals that don't have a central dialysis unit. Additionally, most dialysis patients must restrict their dietary intake of sodium, potassium, and phosphorus. For example, a common food during Hajj is dates, which are reported to contain a high amount of potassium and thus are recommended to be consumed less on a renal diet. It is important to discuss nutritional needs with a nephrologist before travel as these may vary amongst individuals.

Some patients are on Peritoneal dialysis which is another form of renal replacement therapy. This therapy gives a patient more independence (as they don't have to visit a dialysis facility 3 times a week as for haemodialysis). It however, does involve apparatus at home like a PD machine and dialysate bags. It is important for such patients, to discuss their situation with their nephrologist and make arrangements well in advance before Hajj including sorting arrangements for peritoneal dialysis.

Hajj and Hypertension

Every year, approximately 25-37% of pilgrims suffer from hypertension and diabetes(26). Hypertension is a risk factor for stroke, kidney disease and CVD and thus is considered a major health issue globally. However, less than 20% of individuals have it under control with reports of a significant number of hospitalised Hajj pilgrims having hypertension with 3% of ICU admissions mostly due to hypertension (5). It is advised that prospective pilgrims undergo an adequate health assessment, paying close attention to how effectively

they can control their chronic diseases. It is also recommended to bring enough supplies of regular medications and monitoring equipment as adherence to antihypertensive medications and monitoring blood pressure regularly is crucial for blood pressure to remain controlled during Hajj. Emphasis should be on increasing the pilgrims' understanding of their diseases, compliance with their medication, self-monitoring, and the adoption of strategies to prevent unfavourable health outcomes.

Hajj and Diabetes

The Hajj pilgrimage can also have a great impact on patients with diabetes with an increased risk of hypoglycaemia and hyperglycaemia. This may be attributed to changes in diet, delays in mealtimes, dehydration secondary to hot temperatures and strenuous activity during Hajj. Poor adherence to antidiabetic medication is also common as pilgrims are preoccupied with rituals of Hajj and may lack information about diabetes self-management during Hajj.

This makes complications such as diabetic ketoacidosis, fatigue, and unconsciousness greater and can be observed in diabetic pilgrims(27). These individuals are also at a high risk of infections and foot complications as Hajj entails prolonged periods of walking, often without any kind of protective footwear. Therefore, several precautions are necessary to prevent and treat such complications.

Pre-Hajj counselling should be provided to all prospective pilgrims including the importance of having a summary of their current treatment regimen and adherence to their medications. Sick day rules for diabetes should also be included in this guidance which involves measuring blood sugar regularly, staying hydrated and if taking anSGLT2i tablet, to stop taking them when unwell. For the prevention of foot problems, it is recommended to use well-fitted shoes, padded socks, and to avoid walking barefoot. To avoid a hypoglycaemic episode, it is suggested to avoid skipping meals, carry emergency snacks, stay hydrated and get some rest in between the Hajj rituals(28). The crowded conditions of Hajj may be an ideal environment for the spread of infectious diseases which can result in an increased risk of hospital admission among diabetic pilgrims therefore it is recommended to complete all vaccinations including pneumococcal and influenza.

Prior to Hajj, an in-depth clinical assessment with a doctor is necessary, attending an education session on diabetes control, preparing enough medication and

monitoring equipment including a cool pack to store insulin and bringing appropriate footwear are all necessary steps a prospective diabetic pilgrim should take. During Hajj, consulting a medical team is also very crucial if feeling unwell. After Hajj, scheduling a check-up with a physician for a follow-up and necessary investigations performed, and readjustments made if needed.

Conclusion

One of Islam's five pillars is the Hajj pilgrimage. Every Muslim who is financially able to do so and is in good health is obligated to perform Hajj at least once in their lifetime. Although it is a life-changing spiritual experience, Hajj can foster a stressful environment and present unique challenges to people suffering from chronic diseases. A pre-travel consultation with a healthcare professional is recommended to assess fitness for travel, with an emphasis on guidance, education, and risk stratification for all prospective pilgrims with a chronic condition. It is very important healthcare providers and patients are aware of the risks that could happen during Hajj and the importance of well-being to ensure pilgrims perform Hajj safely.

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