

Post-Streptococcal Acute Glomerulonephritis in a 7-Year-Old Boy: Islamic Perspective on the Prevention of the Disease

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ABSTRACT

Acute glomerulonephritis is inflammation of the kidney mediated by an immunological process. Group A β -haemolytic streptococcal infection is common in children aged 5-12 years old and can lead to acute post-streptococcal glomerulonephritis which may develop after recovery from a streptococcal throat infection or skin infection (impetigo). 97% of cases occur in less developed country. The incidence has decreased in industrialized nations due to improved hygienic condition. A 7-year-old boy, the eldest child of 4 siblings from a divorced parent, was admitted to Hospital Tengku Ampuan Afzan Kuantan in March 2015 due to facial puffiness for 1 day duration. There was also dark colored urine. Patient had history of productive cough for 3 days and fever for 2 days. Father also complained of skin ulcer on patient's right feet for about 1 month. There was hypertension (198/80 mmHg). Urine examination showed hematuria, proteinuria, and leucocyturia. Anti-streptolysin O titre was high (1:800) and complement C3 level was low (0.29). Patient was treated with antibiotic, diuretic, and anti-hypertension. The child is entrusted to the parents who will be called by the Almighty, who will ask them about this trust. Parents play vital role in maintaining and promoting the good health of the children. Parents should also pay attention to cleanliness, personal hygiene and the prevention of disease, especially infection. Islam paid attention to washing hands and cleansing the air inhaled into the lungs by regular cleaning of the nose as part of ablution before performing prayer. Parents are responsible in preserving life, health and growth of their children. Caring for cleanliness and hygiene is not only deemed a good habit in Islam but also rendered into rituals that constitute part of the faith itself.

KEYWORDS: acute glomerulonephritis, children, Islam, prevention, hygiene

INTRODUCTION

Group A β -hemolytic streptococcal infections are common in children aged 5-12 years old and may result to post-infectious complication of acute glomerulonephritis. Post-streptococcal glomerulonephritis is caused by prior infection of the throat and skin prior to association with specific nephritogenic strains of group A beta-hemolytic streptococcus which are serotype 12 and 49 respectively.^{1,2} Although post-streptococcal glomerulonephritis continues to be the most common cause of acute nephritis in children globally, where 97% of cases occurring in the developing countries with the annual burden of post-streptococcal acute glomerulonephritis remains at a level of at least 9 cases per 100,000

inhabitants.³ Presumably due to improved hygiene conditions and with the easier and earlier access to appropriate medical care for streptococcal infections, the overall incidence has declined in industrialized nations.^{2,3} Poverty, crowding, close physical contact and poor personal hygiene promote impetigo.⁴

Hygiene implicates practices that promote physical and physiological health as well as the social well-being of the persons.⁵ Preserving good personal hygiene such as hand washing, bathing, avoiding uncooked foods, brushing the teeth, trimming of nails et cetera are all related to maintaining personal and public health. Allah says in Holy Quran Al-Baqarah 222, "Truly Allah loves those who turn to Him in repentance and loves those who purify themselves by taking a bath and cleaning and washing thoroughly their private parts, bodies for their payers". The messenger of Allah Prophet Mohammad (PBUH) said, "Cleanliness is half of faith". Islam paid attention to washing hand and cleansing the air inhaled into the lungs by regularly cleaning the nose as part of ablution before

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performing prayer. Cleanliness and hygiene is not only deemed a good habit in Islam but also rendered into rituals that constitute part of the faith itself. Growing up with divorced parents leads the child to experience negligence and unable to be provided for to proper care from both parents. A child is an Amanah from Allah SWT to the parents which they will be questioned later in the hereafter about this trust. Parental responsibility of preserving the life and health of their child, and providing care as he or she grows is part of Islamic Sharia. The child cannot protect or take care of him or herself as he or she is unable to do so. Care and protection are the parents' responsibility to take charge of their child's need, to lead the child, give proper food, and keep or protect him or her from illnesses that can cause harm.⁶

Case report

A 7 year old boy with no known medical illness presented to Hospital Tengku Ampuan Afzan Kuantan due to facial puffiness for 1 day duration not associated with redness or itchiness. Patient had history of greenish sputum for 3 days and fever for 2 days. Father also complained of skin ulcer on patient's right feet for 1 month. His parents are divorced. He is now staying with his mother. Birth, development, immunization and past medical history were uneventful. On physical examination, he was afebrile and haemodynamically stable. There were resolved facial puffiness and healed lesion on left feet with skin desquamation. No other swelling were noted. Blood investigations showed high total white blood cell counts of 14.09×10^9 indicating ongoing inflammatory process; with renal function showing high urea of 12.1mmol/L, and high creatinine of 132 $\mu\text{mol/L}$ which indicate renal impairment. Liver function test showed high albumin level 6.4U/L and normal liver enzyme to rule out disease caused by liver. Urine examination results showed high leucocyte 500, proteinuria 5g/L, and hematuria 250. Anti Streptolysin O Titre was positive 1:800 IU/ml which confirm serological evidence of antecedent streptococcal infection. Serum C3 level was low 0.29 which is significantly reduced in more than 90% of patients in acute phase. Patient had high blood pressure 198/80 mmHg and was given nifedipine. Patient also had facial puffiness and was given intravenous furosemide and restriction of fluid. Oral penicillin was also given. Patient had no hypertensive encephalopathy in the ward.

DISCUSSION

Patient was diagnosed with post-streptococcus acute glomerulonephritis due to prior upper respiratory infection and skin infection. Acute glomerulonephritis is mediated by an immunological process. Group A β -haemolytic streptococcal infection is common in children aged 5-12 years old and can lead to post-streptococcal acute glomerulonephritis. It may develop 1-2 weeks following recovery from a streptococcal throat infection or 6 weeks from rarely skin infection

(impetigo). The cases are spread worldwide. Presumably due to improved hygienic condition, the overall incidence has reduced in industrialized countries. 97% of cases occur in less developed country especially in areas where skin infections are common.⁷

Previous infection caused deposition of immune complex on glomerular wall which activates compliment system and caused vasculitis and hematuria. Activation of compliment system caused angiocapillary proliferation which restricts glomerular blood flow and eventually decrease perfusion to kidney. This causes oliguria and activation of renal angiotensin system which then caused hypertension.⁸ This also involved activation of compliment system which in this case can be proven by decrease of c3 level up to 6 weeks.

Patient presented with facial puffiness due to salt and water retention resulting from reduced glomerular filtration rate (GFR).⁹ Dark colored urine also can be defined as proteinuria, white blood cells, and gross hematuria which were proven by urine examination. Several serology investigations can be done to prove it by anti-streptolysin O for pharyngeal infection or ant DNase B for skin infection.⁸ Renal profile will show degree of impairment by means of increased urea and creatinine.

Post-infectious acute glomerulonephritis is frequent in this patient's age and it has a male predominance. Patient can be given diuretics such as intravenous furosemide to resolve oedema and calcium channel antagonist, vasodilators or angiotensin-converting enzyme inhibitor used to treat hypertension.⁸ For this case, the patient is given Furosemide and Nifedipine. Restriction of fluid is important to avoid fluid overload. Vital signs must be monitored to avoid complication which is hypertension. Antibiotic therapy with Penicillin for 10 days course is advised to limit the transmission of nephritogenic organism. Nephrotic chart is to monitor weight and input and output of fluid in order to check for positive balance. Renal biopsy is indicated in case of acute renal failure, hematuria, proteinuria and low c3 level persisting for more than 2 months, in the absence of evidence of a streptococcal infection or normal compliment level. Long term monitoring is for AGN complications, which are hypertension and acute renal dysfunction by means of monitoring blood pressure and urine examination for blood and protein for one year. Patients have risk of developing encephalopathy and heart failure as complication of hypertension. Hypertensive encephalopathy should be diagnosed in patients with blurred vision, severe headache, altered mental status or new seizure.⁸ Monitoring C3 level after 8 to 10 weeks may be useful.

Some of the issues that may be raised from the case is parent's responsibility in preserving life, health and growth of the child and patient's personal hygiene. Epidemiologically there is a reduction in

poststreptococcal infection due to improved hygienic condition.⁹ Post-streptococcal acute glomerulonephritis usually occurs as sporadic cases, but epidemic outbreak has taken place in crowded population with poor hygiene and high incidence of malnutrition, anemia and intestinal parasites.¹⁰

The child is entrusted to the parents who will be called by the Almighty, who will then question the parents about this trust. The child cannot simply take care of or protect him or herself. He or she lacks the ability to do so. In early life, a child does not understand real danger. Parents' duty is to protect their children from illness and protect them from dangers that may endanger their lives and interfere their growth. Parents should also pay attention to cleanliness, personal hygiene and the prevention of disease, especially diarrhea and infection with parasites.⁶

Islam reminds us against ignoring the need to give our children with medical treatment or with preventive measures against fatal diseases. Islam prefers a physically strong believer than a weak believer. The Messenger of Allah, Peace be Upon Him said: "A strong believer is better than weak believer". Another Hadith of the Prophet, Peace be Upon Him said: "It is a grave sin to neglect a person whom he is responsible for sustaining". The patient has divorced parents whom may have been negligent of his health. Parents' duty and patronage from destructive practices stated that parents shall protect the child from practices and traditions which are socially or culturally destructive or dangerous to the health and from practices which have negative effects on his/her welfare, dignity or growth, as well as those leading to discrimination between children on basis of sex or other grounds according to the regulations and without prejudice to Islamic Shari'a.¹¹ Thus, parents play a vital role in maintaining and promoting the good health of the children.

Cleanliness provides protection from many diseases. The general rule in Islam pertaining to the fulfillment of cleanliness in body and clothes, and to the importance of keeping a pleasant and beautiful appearance, as evident in Hadith of Prophet, Peace Be upon Him, in which he says: "Allah is beautiful and loves beauty". Health, cleanliness and hygiene take a great part of Islam's attention. Indeed, hygiene is not only presumed a good practice in Islam but also considered into rituals that constitute part of the faith itself.¹²

Parents also have a duty to maintain the cleanliness of utensils used for preparing or serving the food of their children. He or she should wash his or her hands well with water and soap before preparing foods and afterwards. Washing hands is part of ablution required before performing prayer. Hand hygiene can be kept by 7 rules of hand washing in order to prevent transmission of infection. To prevent respiratory illnesses, Islam applied to cleansing the air inhaled into the lungs by washing

the nose as part of ablution. It is a great health practice and washing of all the exposed parts of the body like hand, feet, face, mouth and nostrils five times a day has great preventive measures. In the Holy Quran Allah says, "O believers when you stand up for prayers wash your faces and your hands up to the elbows and wipe your heads and wash your feet up to the ankles. If you are unclean bath your whole body (Surah Al Maidah: 6).⁵

CONCLUSIONS

Parents are responsible in preserving life, health and growth of their children. Caring for cleanliness and hygiene is not only deemed a good habit in Islam but are also rendered into rituals that constitute part of the faith itself.

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