

Experiences of children with kidney failure in Gaza

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Abstract

Background: Children with kidney failure in Gaza are particularly vulnerable because of the conflict.

Aim: To document the condition of children with kidney disease in Gaza and the impact of the October 2023 war on their health.

Methods: We report the experience of children with kidney disease in Gaza, including those supported by Children Not Numbers.

Results: Of the 45 children who lived with kidney failure in Gaza, Children Not Numbers supported 18. Six of those supported by Children Not Numbers were on haemodialysis and had significant electrolyte abnormalities. Ten of the children, among those not supported by Children Not Numbers, died of kidney failure due to inadequate access to dialysis.

Conclusion: Children with kidney failure in Gaza currently have suboptimal access to dialysis and transplant, thus reducing their chances of survival. Urgent actions are needed to enable them to access life-sustaining treatment and care.

Keywords: kidney failure, kidney disease, renal failure, dialysis, children, paediatric, haemodialysis, Gaza

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Background

Chronic kidney disease (CKD) is a progressive, incurable, lifelong condition which can lead to kidney failure. It affects more than 800 million individuals – up 10% of the global population – and it is one of the leading causes of mortality in North Africa and the Middle East (1). Although less prevalent in children, CKD remains a devastating illness. Mortality for children with kidney failure globally is between 30 and 150 times the general paediatric population and the expected remaining lifetime for a child aged 0–14 on dialysis is reduced to 20 years without access to kidney transplant (2). Children with CKD also have lower health-related quality-of-life scores and lower neurocognitive ability than their healthy peers (3). However, CKD remains a treatable condition with good health and good quality-of-life outcomes when there is access to paediatric kidney specialists, adequate nutrition, dialysis and transplant services, and multidisciplinary medical and psychosocial support.

Gaza Strip is a small Palestinian territory located on the Eastern Mediterranean coast. It had a total area of 141 square miles and a population of 2.3 million people before the war, of which children were 47% (4,5). Before the October 2023 war, 1100 Palestinians, including 45 children, were living with kidney failure in the Gaza Strip and life-sustaining dialysis and transplant care was standard in Gaza and West Bank. More than 13 000 dialysis sessions were provided for patients with kidney failure in Gaza Strip hospitals every month and this required more than 13 000 filters and other consumables (6). However, there were challenges accessing dialysis

service due to the 16-year military and economic blockade of the territory. Due to the shortage of dialysis supplies, on 15 September 2023, the Director of Hospital Pharmacy Department, Ministry of Health, Gaza Strip, appealed to all concerned organisations to help save the lives of kidney failure patients. This paper documents the clinical experience of children with kidney failure in Gaza during the October 2023 war.

Methods

We collected retrospective and contemporaneous clinic data of children with kidney failure in the Gaza Strip. Based on this, we describe the characteristics and outcomes of the children during the conflict to highlight the impact of the war on their wellbeing. Some of these children were under the care of Children Not Numbers (CNN), a non-government organisation providing advocacy, medical and logistic support for the treatment, care and evacuation of children from Gaza Strip since the war started on 7 October 2023.

Results

CNN supported 18 children with kidney disease, median age 7.0 (interquartile range 3.3–10.4) years old. Seven (39%) of them were male and 8 (44%) had congenital anomalies of the urinary tract as their primary kidney disease and 6 of them were on haemodialysis, of whom 3 were evacuated to Egypt (2) and United Arab Emirates (1). Two patients had previously received kidney transplant and developed kidney allograft failure, necessitating re-

establishment of dialysis due to (i) a shortage of essential and previously available anti-rejection medications and (ii) the loss of access to Eculizumab treatment for a child with atypical haemolytic uraemic syndrome, resulting in disease recurrence and transplant allograft failure. The dialysis patients had significant electrolyte abnormalities including hyperkalaemia and uraemia, suggestive of inadequate dialysis. There were difficulties in sourcing appropriately sized permanent haemodialysis vascular catheters for 2 of the children. Ten children (among those not supported by CNN) died of kidney failure as a result of inadequate access to dialysis.

Due to the destruction of facilities with dialysis equipment, displacement of patients and overcrowding there was a reduction in dialysis sessions from 4 to 2 hours, and from 3 times to twice a week, for both children and adult patients. At a time, Al-Aqsa Hospital managed about 600 patients with only 24 dialysis machines. Water was processed through a central reverse osmosis system and circuits and machines were regularly disinfected with citric acid. Electrolyte levels and dialysis adequacy tests were conducted sporadically.

Of the remaining 12 patients supported by CNN who were not on dialysis, 5 had genetic tubular disorders including Bartter's syndrome (2), renal tubular acidosis (2) and Fanconi syndrome (1). These patients were especially vulnerable to medication shortages, poor nutrition and poor access to water. All of them had substantial electrolyte abnormalities and malnutrition resulting in severe failure to thrive. Due to the inability to receive the standard of care required, these patients were triaged as requiring urgent medical evacuation from Gaza, however, they have not yet been permitted to leave Gaza for medical treatment. One child with Bartter's syndrome died of electrolyte disturbances due to the inability to access medications.

Discussion

CNN is dedicated to improving the lives of children in Gaza through a comprehensive approach to health, safety, education, and rehabilitation. It has facilitated short-term medical evacuations and provided a multidisciplinary approach to medical triage and management, supporting senior and junior medics in the Gaza Strip. The data from CNN provides valuable insights to the challenges faced by children with kidney disease in the Gaza Strip. Our small cohort shows that the conditions of children living with kidney failure in Gaza have become untenable.

A 2023 report from the International Society of Nephrology shows that there is on average 5.1 centres for long-term dialysis per million population globally and 3.3 dialysis centres per million population in the Middle East (7). Before the war, there were a comparable 2.7 dialysis centres and 0.3 kidney transplant centres per million population in the West Bank and Gaza, which closely compared to 0.5 transplant centres globally and 0.3 in the Middle East. Despite the overstretched material and human resources in Gaza, an effective dialysis and

transplant service was embedded in the healthcare system (7). The only paediatric dialysis unit in the Gaza Strip was located in Al-Rantisi Specialized Hospital for Children and it contained 15 dialysis machines specifically for children. It provided 3 dialysis sessions per week for children, each lasting 4 hours, in alignment with the standard of care for adequate dialysis provision. Forty-five children with kidney failure were received haemodialysis in Gaza prior to the war.

In August 2016, the International Society of Nephrology sister centres programme, in partnership with Al-Shifa Hospital, Gaza, and Royal Liverpool University Hospital, United Kingdom, successfully conducted transplant for 51 kidney patients in Gaza with 94% one-year graft survival rate (8). This was a successful and sustainable kidney transplant programme in Gaza and it gave hope of a good quality-of-life for all kidney failure patients. However, since the outbreak of the war, Gaza has suffered significant destruction of its infrastructure, with the destruction or severe disruption of all aspects of civilian life. Between 7 October 2023 and 24 September 2024, there were 1043 attacks on health care facilities and personnel in Gaza and the West Bank, with 885 health care workers killed (9,10). Thirty-two of 36 hospitals were destroyed or damaged (11,12), including Al-Rantisi Specialized Hospital for Children, the only dedicated specialist children hospital. Consequently, the hospital has been unable to deliver vital dialysis services to children.

The war has had a catastrophic toll on children, with immeasurable psychological trauma for all children (13–15). The survival of children with kidney failure depends on safe access to functioning health care facilities that can regularly deliver dialysis, medications, access to good nutrition, clean water, and shelter, which are fundamental rights enshrined in the UN Convention of the Rights of the Child (16).

Before the conflict, Al Aqsa Martyrs Hospital catered for 143 adult patients requiring dialysis in the Gaza Strip. Due to the conflict, the number increased to approximately 600, including children, thus overwhelming the delivery of safe and effective dialysis care. Only one dialysis machine was allocated to children out of 12 before the war and patients were required to queue from the early hours of the day for a chance to receive dialysis (6). This limitation in resources forced a significant reduction of dialysis sessions from 4 hours 3 times a week to just 2 hours twice a week for each patient. It severely impacted long-term prognosis and the inadequate dialysis took a significant toll on the health and survival of children with kidney failure. Many of them suffered severe uraemia, anaemia, CKD-mineral bone disease, and fluid overload. Urgent referral for medical evacuation was granted for 15 children altogether. Evacuations require authorisation by the Coordination of Government Activities in the Territories (COGAT), the Israeli authority responsible for the movement of Palestinians out of Gaza and the occupied Palestinian territories. Even for urgent childhood evacuations, the delays last weeks and, in

some cases, months, significantly increasing the risk of harm to the patient. This resulted in high morbidity and mortality.

Permanent central venous vascular access is vital for the maintenance of life-sustaining dialysis. As the war enters its second year, kidney failure patients in Gaza find themselves trapped in a fragile limbo. With no access to transplant services, their dependence on life-sustaining central venous vascular access becomes more critical and more complicated. Line-related complications, such as infections and thrombosis, further exacerbate the already heavy burden of dialysis-related health issues. This is compounded by the shortage of medical supplies, particularly appropriately sized paediatric short-term and long-term double lumen central venous catheters, filters and haemodialysis circuits, and this poses a threat to the survival of the remaining children on dialysis in Gaza. Peritoneal dialysis is not an available option for children in the Gaza Strip due to the shortages of consumables and

lack of experience and sterile preparation areas, further limiting dialysis options. As life-saving kidney transplant is now not possible in Gaza, the restriction of movement of dialysis patients and their kidney donors makes their prospects of survival very low.

Conclusion

Children with kidney failure in Gaza are living on borrowed time. They are left to endure inadequate dialysis indefinitely, thus increasing their disease burden and mortality risk day-by-day. Their only prospect for long-term survival and quality-of-life is lifesaving kidney transplant which has become impossible for the majority of them as the war continues. Immediate end to hostilities is of utmost importance so that this most vulnerable group can access life-sustaining treatments and live.

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Expériences d'enfants atteints d'insuffisance rénale à Gaza

Résumé

Contexte : Les enfants atteints d'insuffisance rénale à Gaza sont particulièrement vulnérables en raison du conflit.

Objectif : Documenter l'état des enfants souffrant de maladies rénales à Gaza et l'impact de la guerre d'octobre 2023 sur leur santé.

Méthodes : Nous présentons l'expérience des enfants atteints de maladies rénales à Gaza, y compris ceux soutenus par l'ONG Children Not Numbers.

Résultats : Sur les 45 enfants vivant avec une insuffisance rénale à Gaza, 18 bénéficiaient du soutien de Children Not Numbers. Six parmi ces derniers étaient sous hémodialyse et présentaient des anomalies électrolytiques significatives. En ce qui concerne les enfants qui n'étaient pas soutenus par Children Not Numbers, 10 sont morts d'insuffisance rénale en raison du manque d'accès à la dialyse.

Conclusion : Les enfants atteints d'insuffisance rénale à Gaza disposent actuellement d'un accès sous-optimal à la dialyse et à la transplantation, ce qui réduit leurs chances de survie. Des mesures urgentes doivent être prises pour leur permettre d'accéder aux traitements et aux soins indispensables à leur survie.

تجارب الأطفال المصابين بالفشل الكلوي في غزة

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الخلاصة

الخلفية: الأطفال المصابون بالفشل الكلوي في غزة من الفئات الأشد هشاشة في ظل النزاع القائم.

الأهداف: هدفت هذه الدراسة الى توثيق حالة الأطفال المصابين بأمراض الكلى في غزة وتأثير حرب أكتوبر/ تشرين الأول 2023 على صحتهم.

طرق البحث: نستعرض تجربة الأطفال المصابين بأمراض الكلى في غزة، ولا سيما أولئك الذين يتلقون الدعم من مبادرة "أطفال لا أرقام".

النتائج: من بين 45 طفلاً مصابين بالفشل الكلوي في غزة شملتهم الدراسة، تلقى 18 طفلاً دعماً من مبادرة "أطفال لا أرقام". وكان ستة من هؤلاء الأطفال المشمولين بدعم المبادرة يخضعون لغسيل الكلى ويعانون اضطرابات كبيرة في توازن الأملاح. ولقد توفي عشرة أطفال من غير المدعومين من المبادرة بسبب الفشل الكلوي الناتج عن عدم توفر خدمات الغسيل الكلوي بشكل كافٍ.

الاستنتاجات: يعاني الأطفال المصابون بالفشل الكلوي في غزة تدني فرص الوصول إلى خدمات الغسيل الكلوي وزراعة الكلى، مما يقلل فرص بقائهم على قيد الحياة. ولذا، يلزم اتخاذ إجراءات عاجلة تضمن حصولهم على العلاج والرعاية المنقذين للحياة.

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