

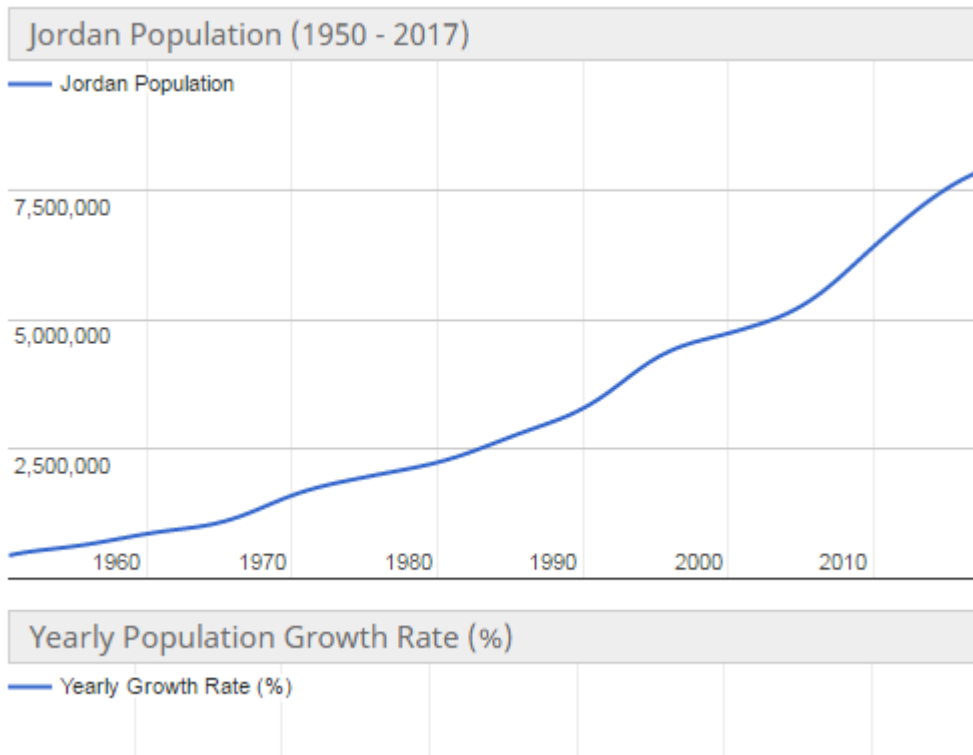
## Pediatric Nephrology in Jordan



Jordan is a small country with a total surface area of 97 thousand square km, situated in the Middle East, Southwest Asia. Jordan is bordered to the north by Syria, to the east by Iraq, Saudi Arabia on the east and south, to the west is the occupied West Bank and Israel. The health sector in Jordan is affected by the political situation in this area and the nearby countries.

The population of Jordan is 9.532 million, the number of Jordanians is 6.6 million while 2.9 million are non-Jordanian representing 30.6% of the overall population, 6.6% of them (1.265 million) are Syrians.<sup>1</sup>

About 11.3% of the population are under the age of 5 years, 35% of the population are below the age of 14 year, while 55% are below the age of 25 years.<sup>2</sup> The health service is presented by a pediatrician for population below the age of fourteen years.



Sixty eight percent of Jordanians and 55% of the overall population, including children less than six years, are covered by various types of health insurances. Around a quarter of non-Jordanians are covered by medical insurance programs. This makes around 72.2% of the overall population having a medical insurance.

The Ministry of Health insurance covers 41.7 % of Jordanians followed by the Royal Medical Services which covers 38%, private insurance companies are responsible for 12.4 %. The remaining coverage is provided by University hospitals, UNRWA, international insurance and others.<sup>3</sup>

**Pediatric nephrology** service is a relatively new subspeciality in Jordan, and previously adult nephrologists were treating adolescent patients while pediatricians were treating younger patients; nowadays the pediatric nephrology services are present in all health sectors in the Kingdom in high standards, advanced and updated settings, with the presence of sixteen qualified pediatric nephrologists.

**Pediatric Nephrology Centers:** There are two main governmental centers for pediatric nephrology. The Royal Medical Services hospital-Queen Rania Abdulla Children Hospital (QRH). This is the only children's hospital in Jordan and nearby countries. QRH is located in Amman; it is considered a major referral center for complicated cases in nephrology and other subspecialities. At the hospital, there is a specialized pediatric nephrology clinic, a pediatric HD and PD Dialysis Unit, a transplant team and ward and PICU service. The PN team consists of four consultants.

The Prince Hamza Hospital (PHH) is a referral center for all MOH hospitals and it has a specialized PD unit using APD modality, recently a kidney transplantation program was started there; the PN team consists of three consultants.

There are two University hospitals; the Jordan University Hospital (JUH) located in Amman, which was the first academic Department of Pediatrics, and was initiated in 1975. Two consultants in PN work at this center.<sup>4</sup>

The King Abdullah University Hospital (KAUH) is located in the city of Irbid. This hospital treats most of patients who are not covered by military insurance from the northern part of Jordan; both HD and PD are available, four patients received a kidney transplant in this center.

The private practicing nephrologists also contribute valuably to the pediatric nephrology care, specially for the medical tourism, which includes all kinds of nephrology branches including RRT and transplantation; all this practiced on a private manner: There are five consultants and all work in the capital.

The south parts of Jordan have only one PN consultant which makes the country deficient from PN care in this part, as well as in the eastern part of Jordan.

### **Renal Replacement therapy**

Both HD and PD are modalities practised at our four centers. More than half of the children with ESRD receive RRT at QRH with a HD to PD ratio of 3:2. This unit is the only specialized pediatric unit in Jordan, the ratio of permanent catheter to AV shunt is 3:2. The rest of pediatric patients outside this hospital receive HD in adult units under the care of pediatric nephrologists.

CAPD is the main type of PD, while only one third of PD patients are on Automated dialysis. The first PD unit was started at the Ministry of Health/ PHH, 2006. Nowadays more the half of children ( n=20) are followed at QRH. The number of patients receiving PD has increased over the last few years which is related to improved care for neonates and infants with ESRF taking into consideration that PD is the only RRT available for patients whose weight is below twelve kilograms.

### **Kidney transplantation**

The first pediatric kidney transplant in Jordan was done at Queen Alia Military Hospital on April 2003,<sup>5</sup> and afterwards the program continued at King Hussien Medical center. One hundred and five kidney transplants have been achieved at this center. There are twenty patients who has received their graft outside Jordan, and have thereafter been followed up at KHMC. The first, five and ten year graft survival is 95% , 91% and 85% respectively, almost all are living related donors, 3% were deceased donors.

Over the last two years, a significant number of children have received kidney transplantation at Prince Hamza hospital, KAUH, and in the private sector.

## **Pediatric Nephrology Qualification**

The number of practising pediatric nephrologists in Jordan are 17, of which three of them in the 1980s and 1990s were the founders of the pediatric nephrology speciality in Jordan . There is no specified certificate program for pediatric nephrology training in Jordan, all the PN have received training for a minimum of 2 years in Jordan and then connected to overseas programs in USA, Canada, UK and France. The recommendation for starting is to have a baseline certificate in pediatrics from the Jordanian Medical Council.

## **The spectrum of pediatric kidney disease in Jordan**

The most common glomerular disease in Jordan is the Nephrotic syndrome; the most common type is minimal change disease, the most common histopathological type of steroid resistant nephrotic syndrome is FSGS.<sup>6</sup>

The prevalence of ESRD in Jordan children was calculated to be 14.5 patients per million. The incidence of ESRD is 3 patients per million children in 2001 increased up to 7.5 patients per million children in 2005.<sup>5</sup> The most common cause of ESRD is congenital anomalies of the kidney and urinary tract (CAKUT).<sup>(7-9)</sup> The most common cause of CAKUT is Kidney Hypoplasia Dysplasia Syndrome. The MOH Renal Registry captures the data on end-stage renal care for all patients in Jordan, including pediatric patients.

UTI is common and neurogenic bladder is common problem that pediatric nephrologists have to deal with in their daily practice.<sup>(10,11)</sup>

Hereditary familial kidney diseases are relatively common due to high rate of consanguineous marriage including familial FSGS.<sup>6</sup> As we found, the NPHS2 mutation is the most common mutation encountered in families with more than one member affected (QRH non published data):<sup>a</sup> newly described association between familial FSGS and retinitis pigmentosa,<sup>12</sup> primary hyperoxaluria.<sup>13</sup> Cystinosis,<sup>14</sup> Nephronophthisis.<sup>15</sup> The rate of consanguineous marriages in 1969 was 51.25 % with 38.95% being between first cousins.<sup>16</sup>

Renal involvement in Henoch Schönlein Purpura occurs in 33.9% with a good prognosis; HSP was also the presenting symptoms of Familial Mediterranean fever in 8% of cases in one study.<sup>17</sup>

The improvement in the survival rate in patients treated for chronic diseases resulted in increased risk of acute kidney injury (AKI) especially in cancer patients, this encouraged one of the pediatric nephrologists to be dedicated to the management of AKI in oncology patients at King Hussien Cancer Center.

Pediatric Nephrologist are affiliated and supported by the Jordanian Society of Nephrology and Renal Transplantation ( JSNRT)

**Conferences:**Annual Conferences are held by the Jordan Society of Nephrology and Renal Transplantation, in cooperation with the Arab Society of Nephrology and Renal Transplantation ASNRT, the International Society of Nephrology (ISN) and Royal Collage of Physician of Edinburgh at the Dead Sea area.

### **Hopes and visions**

We hope that a national program for cadaveric kidney donation will be activated soon. The high percentage of inherited diseases mandates the need to look for local genetic mutations as we think that peculiar mutations are related to this geographic areas. Establishment of fellowship program with certificate in pediatric nephrology. Development of interventional clinical trials.

Achievements ; recent cooperation between JSNRT and IPNA is started and the first IPNA course will be announced soon, this course will be held as a part of The 16<sup>th</sup> Annual Conference of Jordanian Society of Nephrology and Renal Transplantation at the Dead Sea area on Feb 2018.

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