WINSOME PUBLISHING
Global Journal of Clinical Nephrology

Research Article Open Access

Tracing the Path of Pediatric Nephrology: Milestones and Visionaries

Aamir Jalal Al-Mosawi,

Advisor doctor and expert trainer, Baghdad Medical City and Iraqi Ministry of Health Baghdad, Iraq

Corresponding Author: Aamir Jalal Al-Mosawi, Advisor doctor and expert trainer, Baghdad Medical City and Iraqi Ministry of Health Baghdad, Iraq

Received date: November 19, 2024; **Accepted date:** November 24, 2024; **Published date:** December 16, 2024

Citation: Aamir Jalal Al-Mosawi, Tracing the Path of Pediatric Nephrology: Milestones and Visionaries, Global Journal of Clinical Nephrology, vol 1(2). DOI: 10.9567/ISSN.2024/WSJ.92

Abstract

This mini-review traces the historical evolution of pediatric nephrology and honors key pioneers who significantly contributed to the understanding and management of childhood renal disorders. Beginning in the 15th century with Cornelus Roelans' description of nephrotic syndrome, the narrative progresses through pivotal figures such as Theodore Zwinger, Richard Bright, and Emil Abderhalden, who laid foundational knowledge in the field. Notable contributions from Giovanni de Toni, Robert Debré, and Guido Fanconi further advanced understanding, leading to the recognition of the De Toni-Debré-Fanconi syndrome. The review also highlights modern advancements, including descriptions of syndromes by Charles Upton Lowe and Frederic Bartter. Despite progress, gaps remain in understanding the etiology of renal disorders, emphasizing the ongoing need for improved therapies.

Key words: Evolution of pediatric nephrology, pioneers, history of medicine.

Introduction

The landscape of pediatric nephrology, a discipline dedicated to unraveling the complexities of childhood renal disorders, is marked by a rich tapestry of historical milestones and visionary pioneers. From the early observations of Cornelus Roelans in the 15th century to the contemporary advancements of modern medicine, this journey through time reveals the relentless pursuit of understanding and treating pediatric renal ailments.

Evolutionary Insights: In 1484, Cornelus Roelans (Figure-1) etched the first recorded description of nephrotic syndrome, noting the striking manifestation of whole-body swelling in a child. This seminal observation laid the groundwork for centuries of inquiry into childhood renal

disorders. Fast forward to 1722, where the meticulous documentation of Theodore Zwinger (Figure-2) of nephrotic syndrome provided a clarifying lens into this enigmatic condition, rightfully attributing its origins to the kidneys [1, 2].

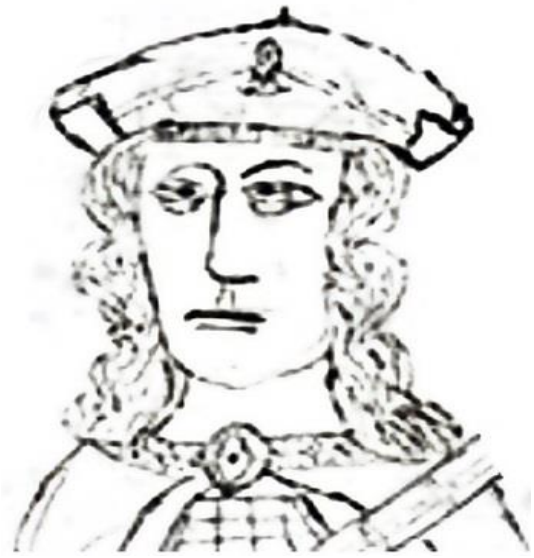

Figure-1: Cornelis Roelans van Mechelen (1450-1525) a Flemish physician and pediatrician

Figure-2: Theodor Zwinger the Elder (August 1533-March 1588) a Swiss physician from Basel

The 19th century heralded pivotal advancements, with Richard Bright (Figure-3) defining the triad of nephrotic syndrome in 1827, and Emil Abderhalden (Figure-4) identifying cystinosis in 1903. George Otto Emil Lignac (Figure-5) provided a comprehensive delineation of cystinosis in 1924, illuminating the intricate clinical spectrum of this disorder, and expanding our understanding beyond renal manifestations [3, 4, 5].

Figure-3: Richard Bright (September 28, 1789-December 16, 1858), an English physician who pioneered in the research of renal disorders

Figure-4: Emil Abderhalden (1877-1950), a Swiss biochemist and physiologist

Figure-5: George Otto Emil Lignac (1891-1954), a Dutch anatomist and pathologist

In 1938, John D Lyttle emphasized a modern classification of childhood kidney disease, including acute glomerulonephritis, chronic glomerulonephritis, and nephrosis (nephrotic syndrome) [3].

Pioneering Paradigms: The De Toni-Debré-Fanconi syndrome stands as a testament to the collaborative efforts of Giovanni de Toni, Robert Debré, and Guido Fanconi, who in the early 20th century, unraveled the complexities of renal tubular insufficiency. Their collective insights paved the way for a deeper comprehension of tubulopathies, shaping diagnostic frameworks and therapeutic approaches [6, 7, 8, 9].

In 1933, Giovanni de Toni (Figure-6) reported a girl with proximal tubular tubulopathy and associated neurological symptoms, including rickets, hypotonia, delayed development, and nystagmus [6].

Figure-6: Giovanni De Toni (March 3, 1895-January 8, 1973), an Italian pediatrician

In 1934, Robert Debré (Figure-7) reported a complex case of tubulopathy in an 11-year-old girl who had rickets associated with severe bone deformities (scoliosis) and multiple fractures [7].

Figure-7: La vida de Robert Anselme Debré (1882-1978), a French pediatrician

In 1936, Guido Fanconi (Figure-8) reported children with hypophosphatemic rickets, acidosis, glycosuria, and excess organic acids in the urine, including some with cystinosis [8]. Therefore, childhood cystinosis has also been called Lignac-Fanconi syndrome.

Figure-8: Guido Fanconi (January 1, 1892-10 October 10, 1979), a Swiss pediatrician

In the mid-20th century, Charles Upton Lowe (Figure-9) and his colleagues described the oculo-cerebro-renal syndrome in 1952, and underscored the interplay between multiple organ systems, ushering in an era of multidisciplinary collaboration [10]. In 1962, Frederic Bartter (Figure-10) and his colleagues described a syndrome originating from a defect in the loop of Henle further expanded our understanding of renal physiology and pathology [11].

Figure-9: Charles Upton Lowe, an American pediatrician (August 24, 1921-February 9, 2012)

Figure-10: Frederic Crosby Bartter (September 10, 1914-May 5, 1983) was an American endocrinologist

Pediatric nephrology is a relatively new discipline, emerging with increasing numbers of physicians and pediatricians interested in studying childhood renal diseases, particularly nephrotic syndrome. Treatment of children with chronic renal failure has evolved through modification of adult treatment principles, with dialysis reported as early as the 1950s. However, there remains a gap in our understanding of the etiology of important childhood renal disorders such as nephrotic syndrome, and better, more convenient, or affordable therapies are still required for many childhood renal disorders, including refractory nephrotic syndrome and chronic renal failure particularly in the less developed countries.

Contemporary Challenges and Future Prospects: Despite the strides made in pediatric nephrology, challenges persist on the horizon. The elucidation of etiological underpinnings remains elusive for conditions such as nephrotic syndrome, underscoring the imperative for continued research and innovation. Moreover, the quest for more efficacious and accessible therapies for refractory nephrotic syndrome and chronic renal failure remains unabated [12-16].

Conclusion

As we traverse the annals of pediatric nephrology, we are reminded of the indomitable spirit of inquiry that drives scientific progress. From the corridors of ancient medical texts to the forefront of modern research labs, each discovery and innovation serves as a beacon of hope for the countless children affected by renal disorders. In honoring the legacies of our pioneering predecessors, we embark upon a journey of continued exploration, armed with curiosity, compassion, and unwavering determination.

Acknowledgement

The author has the copy right of all the sketches (Figures) included in this paper.

Conflict of interest: None.

References

1-Roelans C. Liber de Aegritudinibus Infantium. München: Verl. der Mu¨nchner Dr. (1484).

2-Zwinger T. Anasarca puerorum. In: Basel E, Thurnis JR. Editors. Paedioatreia Pract Curationem Puerorumque Morborum Puerilium etc 1974; 5: 659-66.

3-Lyttle JD. The Treatment of Acute Glomerulonephritis in Children. Bull N Y Acad Med 1938 Apr; 14(4):212-21.

4-Abderhalden E. Familiare cystindiathese. Z Physiol Chem 1903; 38: 557-61.

5-Lignac GOE. Uber storung des cystinstoffwechsels bei kindern. Deutsch Arch Klin Med 1924; 145: 139-50.

6-De Toni G. Remarks on the relations between renal rickets (renal dwarfism) and renal diabetes. Acta Paediatr. 1933; 16: 479-84.

7-Debré R, Marie J, Cleret F, Messimy R. Rachitisme tardif coexistant avec une nephrite chronique et une glycosurie. Arch Med Enfants. 1934; 37: 597-606.

8-Fanconi G. Der fruhinfantile nephrotisch-glycosurische zwergwuchs mit hypophosphatamischer rachitis. Jahrb Kinderheilk. 1936; 147: 299-304.

9-Debre R. Le syndrome du diabète rénal avec rachitisme ostéomalacique incurable et troubles du développement chez l'enfant [Renal diabetes syndrome with incurable osteoalacic rickets and developmental disorders in children]. Osterr Z Kinderheilkd Kinderfuersorge 1949;3 (1-2):9-16 [Article in French].

10-Lowe CU, Terrey M, MacLachlan ea. Organic-aciduria, decreased renal ammonia production, hydrophthalmos, and mental retardation; a clinical entity. AMA Am J Dis Child 1952 Feb; 83(2):164-84. Doi: 10.1001/ archpedi.1952.02040060030004.

11-Bartter FC, Pronove P, Gill JR Jr, Maccardle RC. Hyperplasia of the juxtaglomerular complex with hyperaldosteronism and hypokalemic alkalosis. A new

syndrome. Am J Med 1962 Dec; 33:811-28. Doi: 10.1016/0002-9343(62)90214-0.

12-Al-Mosawi AJ. The conservative management of nonterminal chronic renal failure. Therapy (Clinical practice) [p-ISSN: 2044-9038, e-ISSN: 2044-9046] 2006 Mar (3); 2:305-306. Doi.org/10.2217/14750708.3.2.305.

13-Al-Mosawi AJ. Continuous renal replacement in the developing world: Is there any alternative. Therapy (Clinical practice) [p-ISSN: 2044-9038, e-ISSN: 2044-9046] Mar 2006:3 (2): 265-272. Doi:10.2217/14750708.3.2.26 5.

14-Al-Mosawi AJ. Management of end-stage renal failure. Therapy (Clinical practice) [p-ISSN: 2044-9038, e-ISSN: 2044-9046] 2006 Mar (3); 2:307-309. 2006. Doi.org/10.2217/14750708.3.2.307.

15-Al-Mosawi AJ. The Management of Childhood Chronic Renal Failure in the Developing World. Section on international child health: American Academy of Pediatrics Newsletter. Fall 2008:17-19. Doi: 10.5281/zenodo.3878876.

16-Holliday MA. Dialysis in pediatrics, including use of the artificial kidney. Pediatrics 1958 Sep; 22(3):418-21.