A RETROSPECTIVE STUDY TO ASSESS THE RISK OF ACUTE KIDNEY INJURY (AKI) IN PEDIATRIC PATIENTS HOSPITALIZED AT A FOURTH HEALTH LEVEL - CALI COLOMBIA.

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Introduction and objectives

Acute kidney injury (AKI) is defined as the abrupt decline in renal function. Increased plasma creatinine, reduced creatinine clearance and urinary flow are signs of AKI. Difference in genetic polimorphisms and environmental risk factors could have an impact in the incidence of renal adverse drug reactions among different populations. This study was carried out to determine the association of AKI with nephrotoxic drugs in pediatric patients hospitalized at a fourth-level University Hospital at Cali, Colombia.

Methods

Design: cohort retrospective study. Clinical and sociodemographic data, stored in the SAP electronic medical records, from pediatric inpatients (1 month to 18 years of age) receiving nephrotoxic drugs (acyclovir, aminoglucosides, NSAIDs, betalactam antibiotics, furosemide, cisplatin, methotrexate, iphosphamide, tacrolimus, and ciclosporin A) at the university hospital Fundación Valle del Lili during June 2011 to March 2012 were analyzed to determine the risk of AKI, determined by a 100% increase of creatinine over basal values.

Table 1. General Characteristics

General Characteristics	No AKI (n=166)	AKI (n=15)
Age (Years)	5,6 ± 5,1	3,7 ± 4,8
Weight (Kg)	19,7 15	15,8 14,2
Baseline serum creatinine	0,5 ± 0,6	0,2 ± 0,24 +
Maximum serum creatinine	0,5 ± 0,7	1,1 ± 1,3 +
Length of hospital stay (days)	17,7 ± 17,8	46,7 ± 31,1 +
Nephrotoxic drugs [a]	2,2 ± 1,2	2,3 ± 1,1
Total medication days [b]	11,5 ± 13,9	16,1 ± 9,9
Total medication doses [c]	32,4 ± 35	46,1 ± 31,9
Doses per therapy day [d]	2,9 ± 0,8	2,7 ± 0,8
Medication doses per admission day [e]	2,2 ± 1,7	1,1 ± 0,8

+P 0.05 compared with patients with no AKI.
a. Number of nephrotoxic drugs during the hospitalization period
b. Cumulative number of days exposed to nephrotoxic drugs during the hospitalization period
c. Cumulative number of doses during the hospitalization period
d. Total medication doses divided by total medication days
e. Total medication doses divided by hospital stay

Results

Pediatric hospitalization episodes (n=570) were registered during the study time period (June 2011 to March 2012). Two hundred and sixty two (n=262) hospitalization episodes were excluded for the analysis due to nonexistence of recorded creatinine during the hospitalization period (n=254) and end-stage renal disease (n=8).A total of 308 hospitalization episodes corresponding to 272 pediatric patients were analyzed. Patients age (years) was 5.7 ± 5.2, male 51.3% and female 48.7%, 15.1 ± 17.3 days of hospitalization days, mean basal creatinine was 0.42 ± 0.45.Patients received the following nephrotoxic drugs:betalactam antibiotics (53%), furosemide (36.3%), vancomycin (12.6%), aminoglycosides (11%), NSAIDs (9.4%), calcineurin inhibitors (7.8%), metothrexate (4.5%), cisplatin (1%) and amphotericin B (0.3%). Pediatric patients were receiving one (47.4%), two (29.2%), and three or more (23.4%) nephrotoxic drugs. Fifteen cases (5.5% of hospitalized patients) of AKI were detected in this retrospective study. Risk factors for AKI associated with nephrotoxic drugs were the number of hospitalization days (17.7 ± 17.8 versus 46.7 ± 31.1, P<0.001), sepsis (OR 4; 95% CI: 1.3 – 11.7), cardiogenic shock (OR 10.1; 95% CI: 2 - 50), and hipovolemic shock (OR 4.9; 95% CI: 1.2 -21). Meropenem was the drug most commonly associated with AKI (OR 5.7; 95% CI: 1.9 – 17.4).

Table 2. Nephrotoxic drugs and acute kidney injury

Medication Name	OR	95% Confidence Interval	
		Lower limit	Upper limit
Acyclovir	None with AKI		
Amikacin	None with AKI		
Amphotericin B	None with AKI		
ASA	0,77	0,09	6,34
Cefotaxime	None with AKI		
Ceftriaxone	None with AKI		
Cyclosporine	2,89	0,30	27,67
Cisplatin	5,85	0,49	68,67
Dipyrone	0,49	0,16	1,4640
Furosemide	1,28	0,44	3,71
Gentamicin	11,78	0,69	198,72
Ibuprofen	None with AKI		
Ifosfamide	None with AKI		
Meropenem	5,72	1,88	17,36
Methotrexate	None with AKI		
Piperacillin and tazobactam	0,71	0,2176	2,34
Tacrolimus	1,97	0,39	9,78
Vancomycin	1,23	0,32	4,65

Conclusions

This is a preliminary retrospective study assessing the risk of AKI associated with the use of nephrotoxic drugs at a fourth level University Hospital. The most important associated risk factor for nephrotoxicity was the number of hospitalization days. This research has selection and observation bias, both an intrinsic characteristic in retrospective studies. A prospective study in our hospital assessing the risk of nephrotoxicity in our pediatric service at FVL Cali will be planned during this year.

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