

"IATROGENIC HOSPITAL ACQUIRED ACUTE KIDNEY INJURY: RESULTS OF THE IMPLEMENTATION OF A PREVENTION PROTOCOL"

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INTRODUCTION:

The incidence of Iatrogenic Hospital acquired acute kidney injury (HAKI) may affect between 5-7% of hospitalized patients, increases morbidity and is an independent predictor factor of Length of Stay and Costs. The prevalence of the iatrogenic HAKI usually undervalued between 6 and 35.3%.

AIM:

Analysis of the HAKI, elaboration and implementation of a Protocol of Prevention and Reduction of the iatrogenic HAKI. Iatrogenic HAKI is defined as related to a medical action, either by use of nephrotoxic (iatrogenic for "performance") as for delay in correcting a situation of hemodynamic instability or maintenance treatments inappropriate according to the degree of renal insufficiency (iatrogenic "default").

MATERIAL AND METHODS:

Unicentric and prospective study divided in 2 phases, in a hospital with a referred population of 162000 people.

First Phase: identification and analysis of the HAKI during a first period (July 2007 to March 2008). The inclusion criteria for acute kidney injury were detected automatically by the laboratory tests *.

Second phase: new study the HAKI after the implementation of the Protocol for a second period (July 2010 to March 2011). Comparative analysis and presentation of the results was done.

Inclusion criteria*:

Sudden increase in plasmatic creatinine > 177 µmol/L (2 mg/dL) in hospitalized patients with previously normal creatinine value

Or

Sudden increase of plasmatic creatinine ≥ 50% from baseline values in patients with CKD grades I,II i III

Exclusion criteria:

All patients with CKD grade IV and V were excluded, as well as those with renal atrophy in the ultrasound scan.

No paediatric, ICU or palliative patients were included

Liaño et al. "Epidemiology of acute renal failure: a prospective, multicenter, community-based study. Madrid Acute Renal Failure Study Group" *Kidney Int*, Sept:50 (3): 811-8, 1996.

Laboratory:

- Daily review of all the blood test of hospitalized patients and patients in the emergency room
- Automatically selection of all patients with creatinine level > 177 µmol/l.
- Listing of patients with their identifier hospital number, and the actual and previous creatinine value.

Clinics:

- Review of all selected patients by two physicians in order to detect those with inclusion criteria and to excluded the rest.
- Collected a clinical, laboratory history in a database and analyse the results.
- Detect and register all cases of iatrogenic HAKI.

Iatrogenic: AKI related directly or indirectly to a medical action* (diagnostic o therapeutic).

* Mainly due to lack of attention predisposing factors of renal failure: inadequate detection of risk and lack of prevention and / or improper dosing of drugs.

- Create informatic warnings on the medical history of those patients who have had a previous episode of HAKI.

MULTIDISCIPLINARY PREVENTION PROTOCOL for HAKI with the participation of medical staff and nursing, laboratory, pharmacy and department computer service.

Report the new protocol for prevention and early treatment of HAKI to the rest of the medical and nursing staff

RESULTS:

	Phase I	Phase II	TOTAL	Significance
N° Cases	167	227	394	
M (%)	62,9	60,4	61,4	ns
F (%)	37,1	39,6	38,6	
Age	75,5	74,76	75,09	ns
Previous Renal Function				
I (%)	11,4	17,6	15	ns
II (%)	20,4	20,3	20,3	ns
III (%)	55,7	50,7	52,8	ns
? (%)	12,6	11,5	11,9	ns
Previous HAKI	28,7%	30,4%	29,7%	ns

%	Phase I	Phase II	TOTAL	Significance
Diabetes Mellitus	39,5	33,9	36,3	ns
Hypertension	73,1	77,1	75,4	ns
Vascular Disease	49,1	52,9	51,3	ns
Surgical intervention	11,4	11,5	11,4	ns
Diuretics	62,9	49,8	55,3	ns
NSAIDs	10,8	14,5	12,9	ns
Hemodynamic instability	63,5	67	65,5	ns
Sepsis	31,1	40,1	36,3	ns

%	Phase I	Phase II	TOTAL	Significance
ETIOLOGY				
Prerenal	92,2	93,4	92,9	ns
Intrinsic	20,4	26,9	24,16	ns..(0,084)
Obstructive	6	9,3	7,9	ns
TREATMENT				
Medical	95,8	97,4	96,7	ns
RRT	4,2	2,6	3,3	ns
Diuresis:				
Oliguric	35,3	30	32,2	
Non oliguric	38,9	53,3	47,2	
Non measured	25,7	16,7	20,69	0,012
ICU tranfer	13,2	13,2	13,2	ns
Exitus	12,6	16,7	15	ns

%	Phase I	Phase II	TOTAL	Significance
Iatrogenic	52,1	37	43,4	0,002
Nephrotoxic drugs	21	15,9	18	ns
Delay in hemodynamic correction	31,1	19,8	24,6	ns
Inapropiated treatments	22,8	20,7	21,6	ns
Days to detect the HAKI	4,95	3,92		ns
At the admittance (%)	47,9	61,2	55,6	
Early(1-3 d) (%)	20,4	15	17,3	
Late (≥4 d) (%)	31,7	23,8	27,3	
Duration of the HAKI	8,99	5,83		0,0000...
Length of stay	18,18	13,74	16,93	ns... 0,087

CONCLUSIONS:

- 1- The iatrogenic HAKI has an important prevalence.
- 2- The elaboration of a multidisciplinary prevention protocol for HAKI and its wide application, has allowed a significative reduction of the iatrogenic HAKI and all its consequences.

