Cancers, Chemotherapies and Hemodialysis: A retrospective study

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Rapid advances in cancer therapy have changed the landscape of oncology for patients and practitioners. Patients are deriving significant benefit with

- increased survival
- decreased tumor progression
- less severe overall adverse drug effects.

- Unfortunately, nephrotoxic effects of these agents remain a significant untoward complication, and sometimes limit effective therapy.
• **Acute Kidney Injury (AKI)** is a frequent and severe complication for patients in Onco-Haematology and patients with solid tumors.

• Incidence varies from **12 to 49 %**

• AKI Prognosis is dark when it needs dialysis, with a high level of hospital mortality from **77 % to 84 %**


AKI

**Specific**
Renal impairment as a direct consequence of Cancer pathology

**Related to a** (called a paraneoplastic syndrome)

**Iatrogenic**
Nephrotoxicity of Chemotherapies

**Tumor Invasion**

**External Compression**
INTRODUCTION:

- The support for cancer patients has become that of sick in the long course thanks to the effectiveness steadily improved therapies available in the treatment of cancer: chemotherapy Anteneoplasiques And targeted therapy.

- Tolerance and toxicity especially Renal Of these therapies is a major problem and often under estimated.

- It may be the result of hemodynamic changes, violations parenchymal and/or blockage of tracks excretrices.

- The optimization of the tolerance of renal cancer chemotherapy past by an appropriate assessment of the renal function of patients before and during treatment, to each parish priest in general
Chemotherapies

**Cisplatin & Similar**

Mostly used in Various types of cancer (Lung, Testicle, Ovary, cervix, endometrium, Laropharynx, Bladder, colon and rectum)

The AKI is **Dose-dependent. It is mainly observed with high doses (more than 50 mg/m2.)**

**Methotrexate**

An antimetabolite, Antagonist of folic acid. In leukaemia, breast cancer, gastric carcinoma or Oesophageal reflux, testicles Cancer and lymphomas. Nephrotoxicity is due to its Urinary Metabolite 7OHMTX.

MTX-HD if dose greater than **1g/m2**.

**Gemcitabin**

A nucleotide analogue currently widely used in various types of cancer. Its renal tolerance profile is rather favorable.

**Non-Angiogenic, Targeted Therapeutic:**

Their potential therapeutic targets include the VEGF (Vascular epidermal growth factor) Circulating & Its Membrane receptors. (Bevacizumab)
<table>
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<th>Physiopathology mechanism involves</th>
<th>Therapeutic Class or drug</th>
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<td>Pre renal failure</td>
<td>All drugs inducing vomiting and diarrhea (Cisplatin, Cyclophosphamide)</td>
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<td>Low renal Perfusion (hemodynamic consequences)</td>
<td>Interleukin 2 (by capillary leak Sd)</td>
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<td>Glomerulopathies</td>
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<td>Acute Tubular Toxicity</td>
<td>Cisplatin, Methotrexate, Intravenous immunoglobulins, Ifosfamide</td>
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<td>Intratubular Obstruction due to drug precipitation or its metabolites</td>
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<td>Hemolytic Uremic Syndrome/thrombotic microangiopathy</td>
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<td>Abnormal water balance -hyponatremia</td>
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<td>Chronic renal failure by chronic tubulointerstitial nephropathy (With or without necrosis papillary)</td>
<td>Nitroso-uree</td>
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<td>Immuno Allergic Nephropathies</td>
<td>Cisplatin, Interferon, cytosine Arabinoside</td>
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Retrospective Study
OBJECTIVES

• Determine the frequency of acute hemodialysis patients for a neoplasia etiology or secondary to chemotherapy compared with the general population in acute hemodialysis.

• Identify the mechanism involved in this renal disease for these patients.

• Identify the more frequent haematological pathology that generate AKI for our patients.

• Assess the future of these patients.
METHOD AND PATIENTS:

- Retrospective Study from **January 2011 to March 2013 (26 months)** in our Emergency Dialysis Center.
- **237 Patients requires** Acute Hemodialysis → **41** Patients had an AKI and **29** were Cancer patients.

- Inclusion criterias: AKI that appears
  - after using chemotherapeutics agents.
  - Induced by the tumor process (compression, infiltration).

- Exclusion criterias: patients with True or effective circulating blood volume depletion and diminished GFR (and patients on chronic haemodialysis who developed later a neoplasia.)

- Clinical characteristics studied: Age, gender, type of primitive neoplasia, mechanisms of renal disease, additional risk factors, evolution.
AKI

- AKI after NEOPLASIA 71%
- AKI NO NEOPLASIC 29%
Distribution by Sex

18; 64% male

11; 36% Female

Sex Ratio = 1.6
Distribution According to the Primitiv Neoplasia

- Renal carcinoma: 1, 4%
- Bladder: 5, 17%
- Prostate: 2, 7%
- Uterus: 3, 10%
- Ovary: 3, 10%
- Bronchial: 1, 3%
- Gastric: 1, 4%
- Rhabdomyosarcoma: 1, 4%
Haematological Malignancies

- MM: 8; 70%
- HL: 7%
- NHL: 8%
- BURKIT lymphoma: 7%
- ML: 8%

5 F/3 M
Mechanism of Renal Disease

Chemotherapeutic agents
Induced Renal damage

Neoplasia Direct
Consequences

- tumor lysis Sd
- direct toxicity
- renal carcinoma
- myeloma associated kidney disease
- locoregional infiltration
Additional Risk Factors

- Hypertension: 13
- Diabete: 5
- Tobacco: 8
- Dyslipidemia: 7
71% of supported AKI was linked to a cancer.

A female predominance: 18F/11M

Average Age: 54 Years (With 2 pediatric cases)

Frequent Haematological cancer was Myeloma (F>M)

Nephrotoxicity Found was related to the use of Cisplatin & Gemcitabin.

Tumor lysis Syndrome: Met during certain chemotherapy for haematological malignancies (Lymphoma)

Patients Evolution was predominantly Unfavourable.
PREVENTION OF THE TOXICITÉ RÉNALE OF ANTICANCÉREUX

1. Accurate assessment of renal function using the formula of Cockcroft and Gault and/or of the formula mdrd.
2. Adaptation of the dose and the method of administration at the level of glomerular filtration rate.
3. A good hydration must be ensured, using serum dirty isotonic, the use of serum glucose that can be deleterious to the renal tolerance.
4. Renal function should be monitored, as well as the possible occurrence of anomalies of the urine sediment, proteinuria and hypertension.
5. The other treatments Nephrotoxic Must be avoided as well as the injection of iodinated contrast.
6. Annual monitoring of renal function in these patients.
CONCLUSION

- AKI after chemotherapeutic drug regimens remains a significant problem in the management of cancer patients.

- A well estimation and a close monitoring of renal function is required for this Category of patient because the treatment of the causal disease does not always guarantee a restitution ad integrum.

- Find a balance between vital prognosis of our patients and their kidneys functional prognosis.

- Interest of a Close and continuing collaboration between oncologists, hematologists and nephrologists.
THANK YOU FOR YOUR ATTENTION

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