Cancers, Chemotherapies and Hemodialysis: A retrospective study

Lydia BENHOCINE A.BENZIANE M.BENABADJI
Departement of Nephrology Dialysis and Renal Transplantation.
University Hospital of Beni Messous. ALGERIA

3rd International Conference on
« Nephrology & Therapeutics »
26-27 June 2014. Valencia. Spain

Introduction

- 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.

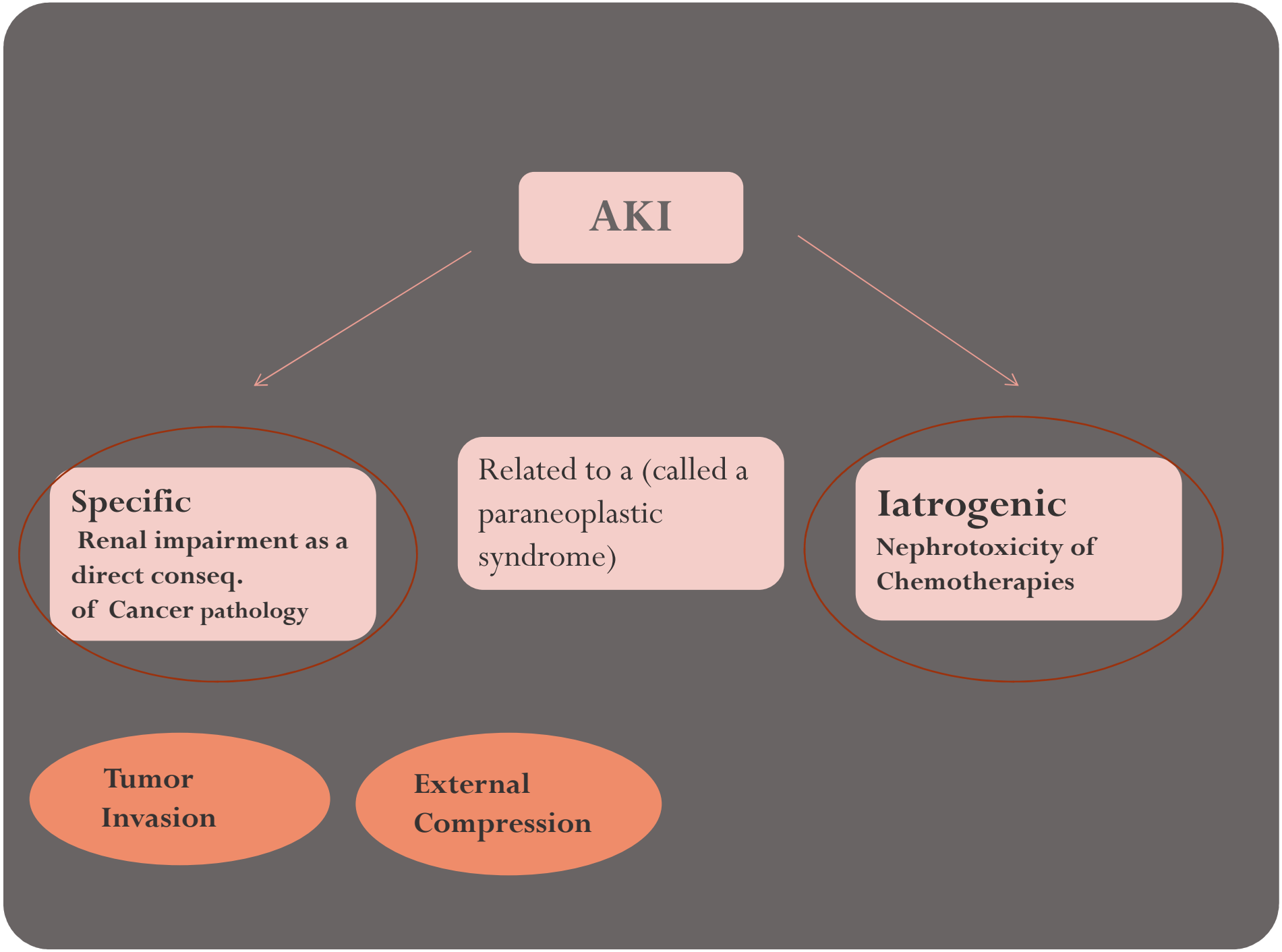
- Incidence varies from **12 to 49 %**
- AKI Prognosis is dark when it needs dialysis, with a high level of hospital mortality from **77 % to 84 %**

1. Lanore DD, Brunet F, Pochard F, Bellivier F, Dhainaut JF, Vaxelaire JF, ET al. Hemodialysis for acute renal failure in patients with hematologic Malignancies. Crit Care Med 2009 ;19:346-51.

2. Benoit DD, Vandewoude KH, Decruyenaere JM, L'Hoste EA, Colardyn FA. Outcome and early prognostic indicators in patients with a hematologic malignancy admitted to the intensive care unit for a life-threatening complication. Crit Care Med 2003 ;31:104-12.

3. Azoulay E, Moreau D, Alberti C, Leleu G, Adrie C, Barboteu M, et al. Predictors of short-term mortality in critically ill patients with solid Malignancies. Intensive Care Med 2008;26:1817-23.

4. Darmon M, Thiery G, Ciroldi M, De Miranda S, Galicier L, Raffoux E, et al. Intensive care in patients with newly diagnosed malignancies And has Need For cancer chemotherapy. Crit. Care Med. 2007.


AKI
Specific
Renal impairment as a direct conseq. 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 i**s 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)

RENAL TOXICITY OF CHEMOTHERAPEUTICS AGENTS

Bull Cancer vol. 95, Supplement FMC no. 8, April 2008

Physiopathology mechanism involves	Therapeutic Class or drug
Pre renal failure	All drugs inducing vomiting and diarrhea (Cisplatin, Cyclophosphamide)
Low renal Perfusion (hemodynamic consequencies)	Interleukin 2 (by capillary leak Sd)
Glomerulopathies	Adriamycine, Mitomycin
Acute Tubular Toxicity	Cisplatin, Methotrexate, Intravenous immunoglobulins, Ifosfamide
Intratubular Obstruction due to drug precipitation or its metabolites	Methotrexate
Hemolytic Uremic Syndrome/thrombotic microangiopathy	Mitomycin, 5-Fluoro-Uracil, Gemcitabin
Abnormal water balance -hyponatremia	Vincristin
Chronic renal failure by chronic tubulointerstitial nephropathy (With or without necrosis papillary)	Nitroso-uree
Immuno Allergic Nephropathies	Cisplatin, Interferon, cytosine Arabinoside

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 futur of these patients.

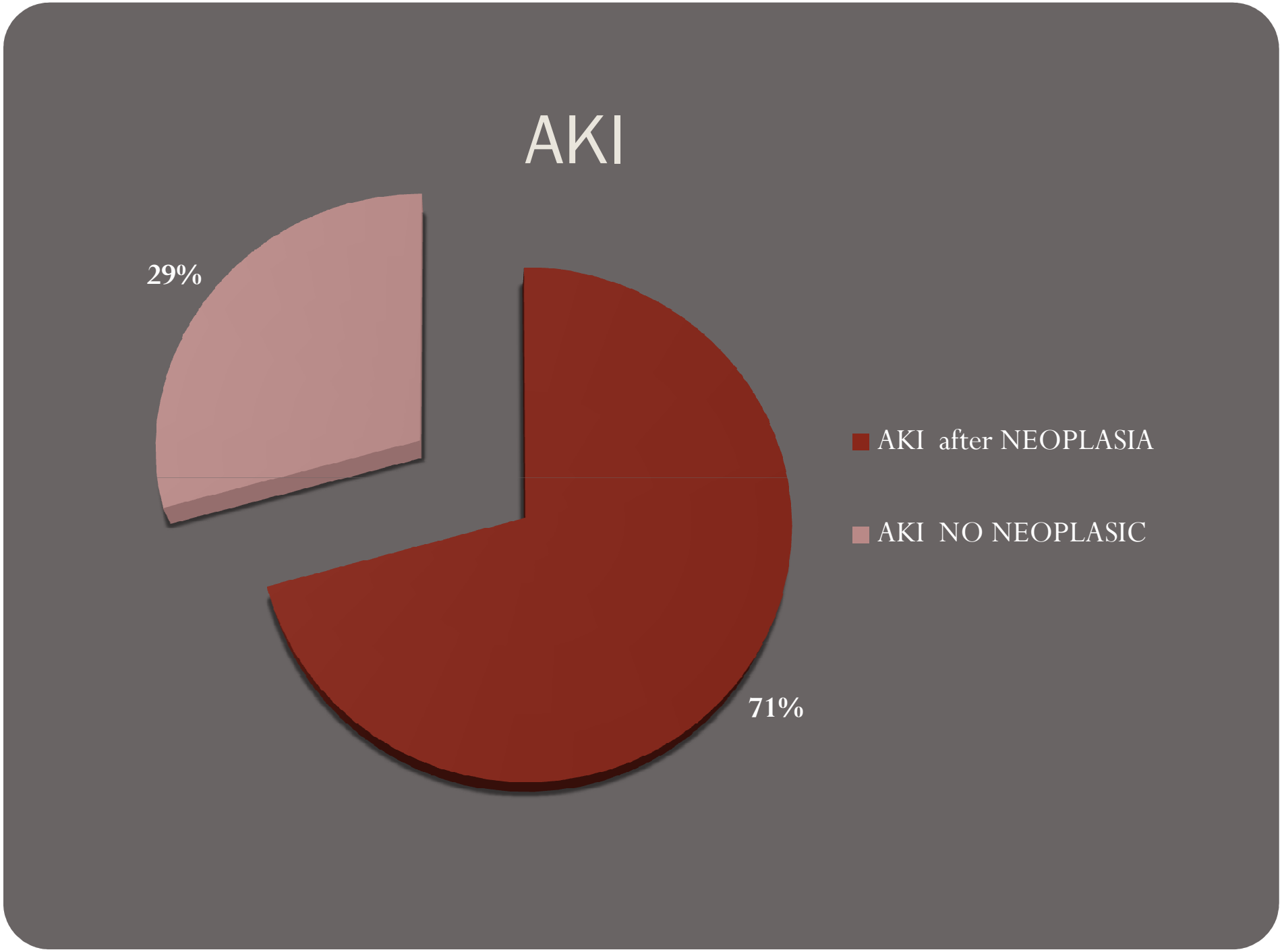
METHOD AND PATIENTS:

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

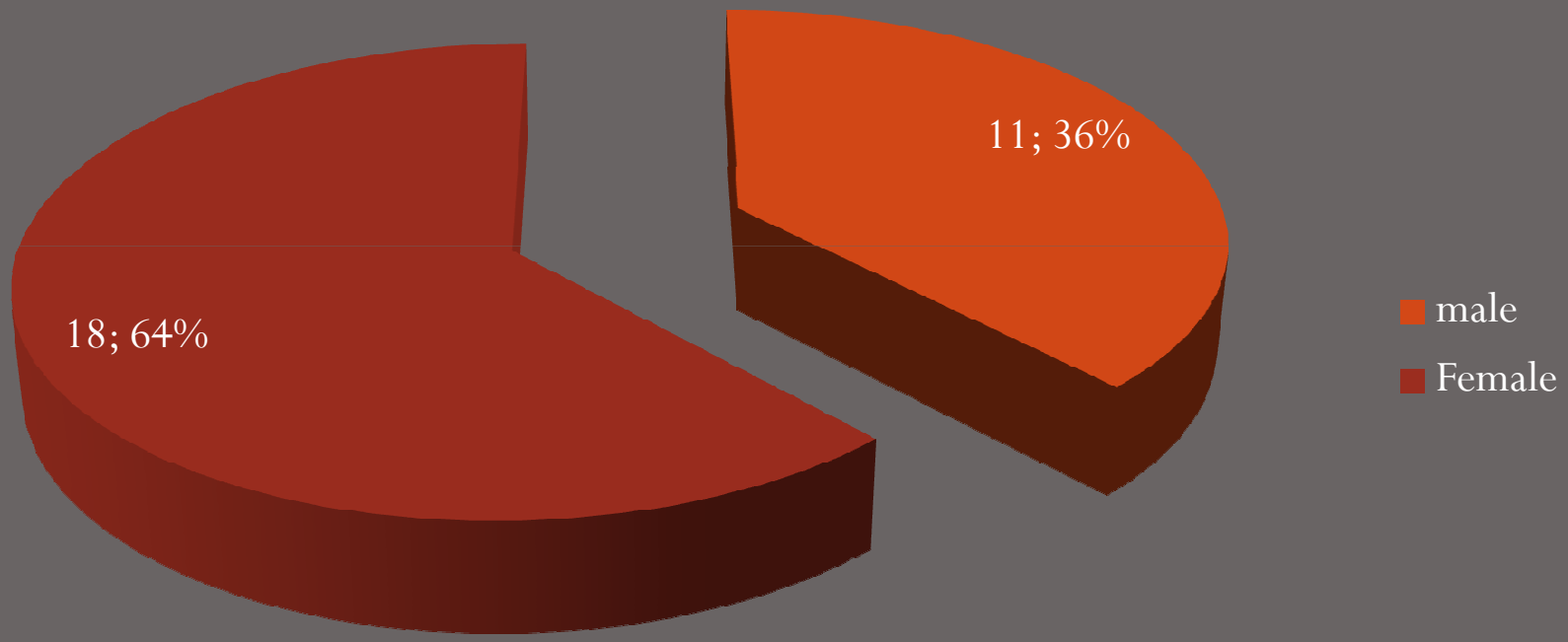
- Inclusion criterias : AKI that appears
  - after using chemotherapeutics agents.
  - Induced by the tumor process (compression , infiltration).

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

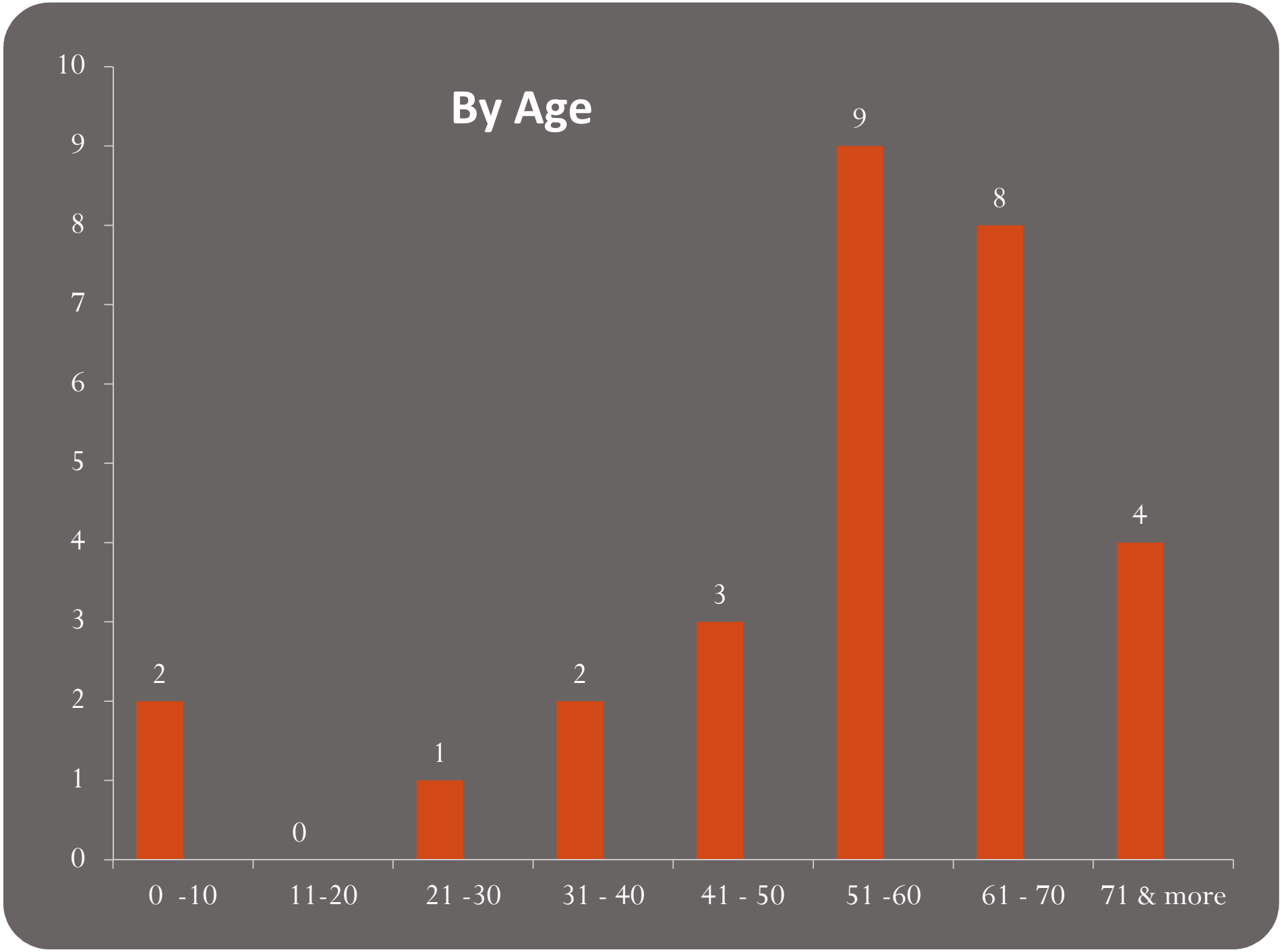
- Clinical characteristics studied: Age, gender, type of primitive neoplasia, mechanisms of renal disease, additional risk factors , evolution.

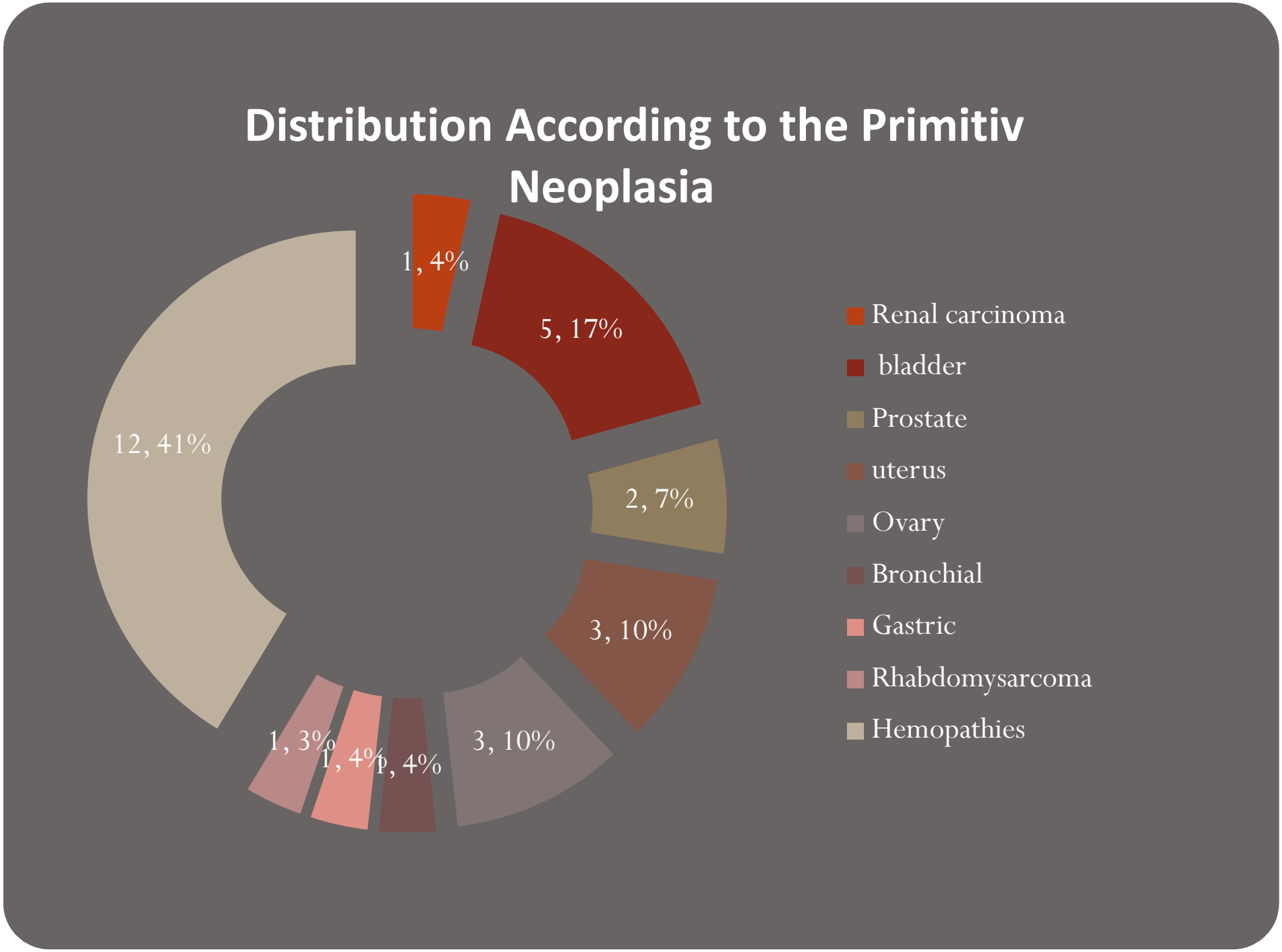

AKI
29%
71%
AKI after NEOPLASIA
AKI NO NEOPLASIC

Distribution by Sex

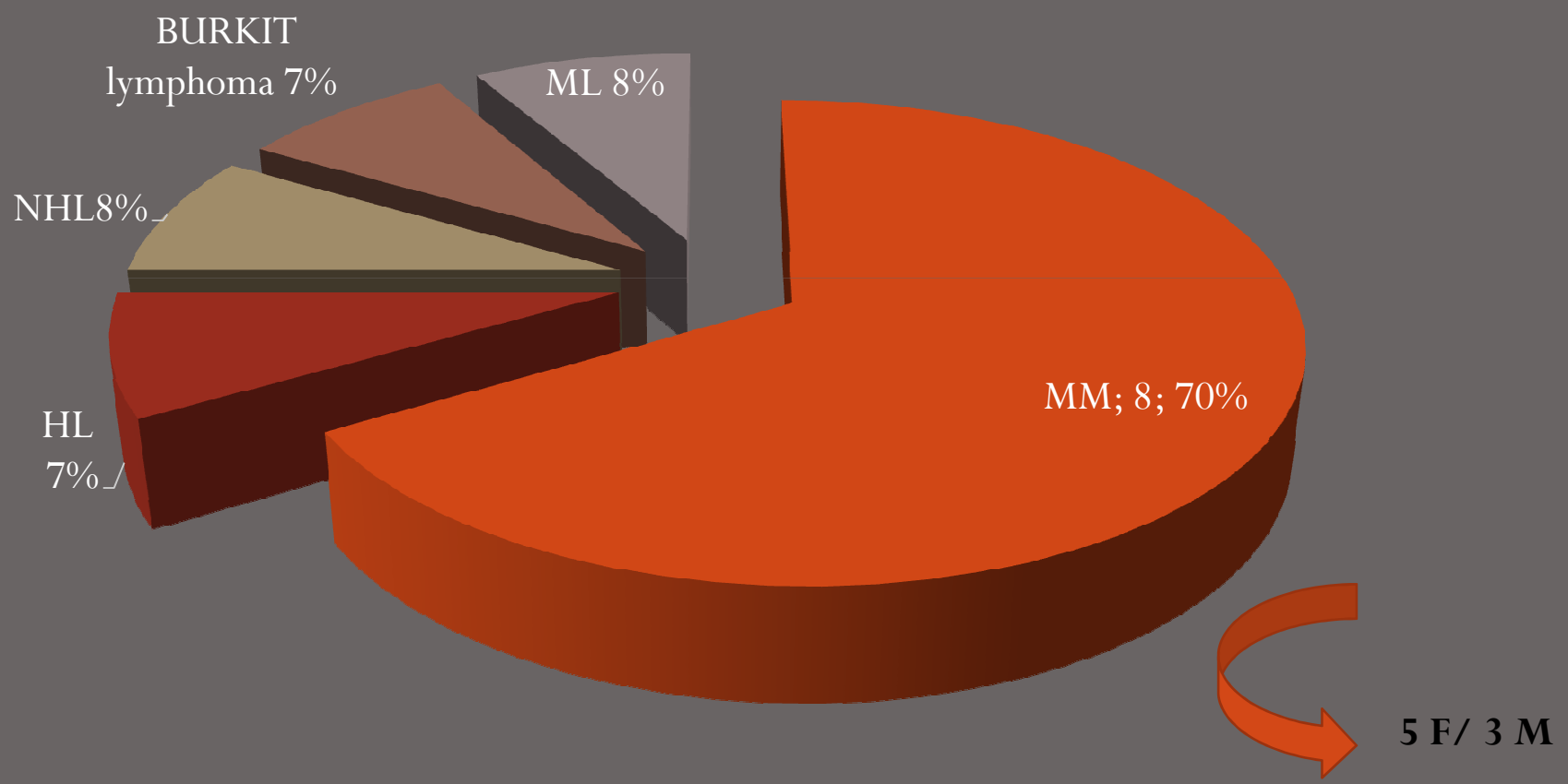


Sex Ratio = 1.6


By Age
10
9
8
7
6
5
4
3
2
1
0
2
0
1
2
3
9
8
4
0 -10
11-20
21 -30
31 - 40
41 - 50
51 -60
61 - 70
71 & more

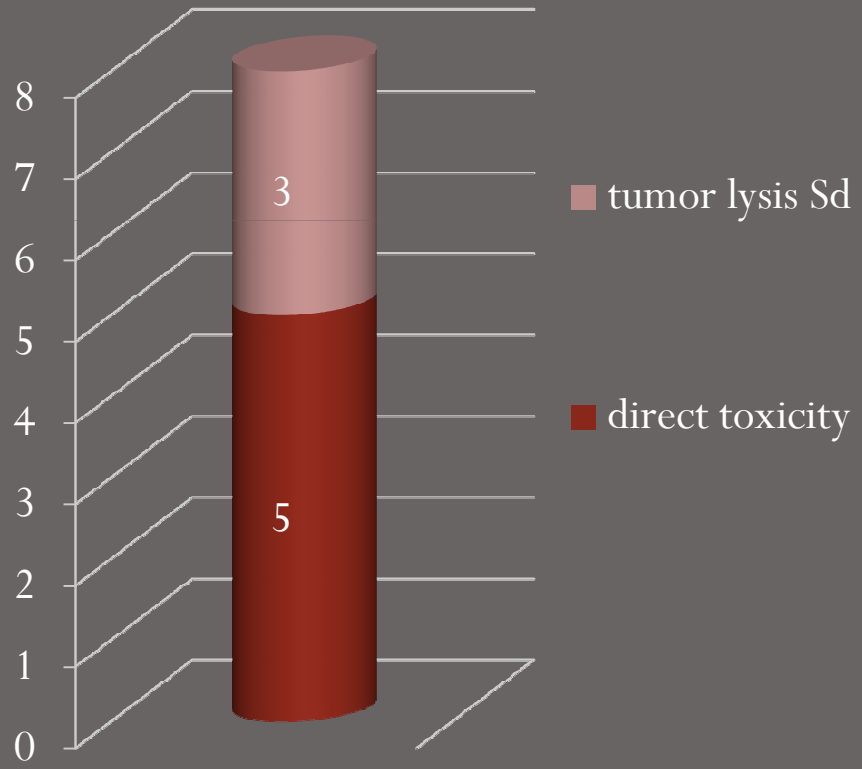

Distribution According to the Primitiv Neoplasia
1, 4%
5, 17%
2, 7%
3, 10%
3, 10%
1, 4%
1, 4%
1, 3%
12, 41%
Renal carcinoma
bladder
Prostate
uterus
Ovary
Bronchial
Gastric
Rhabdomysarcoma
Hemopathies

Haematological Malignancies

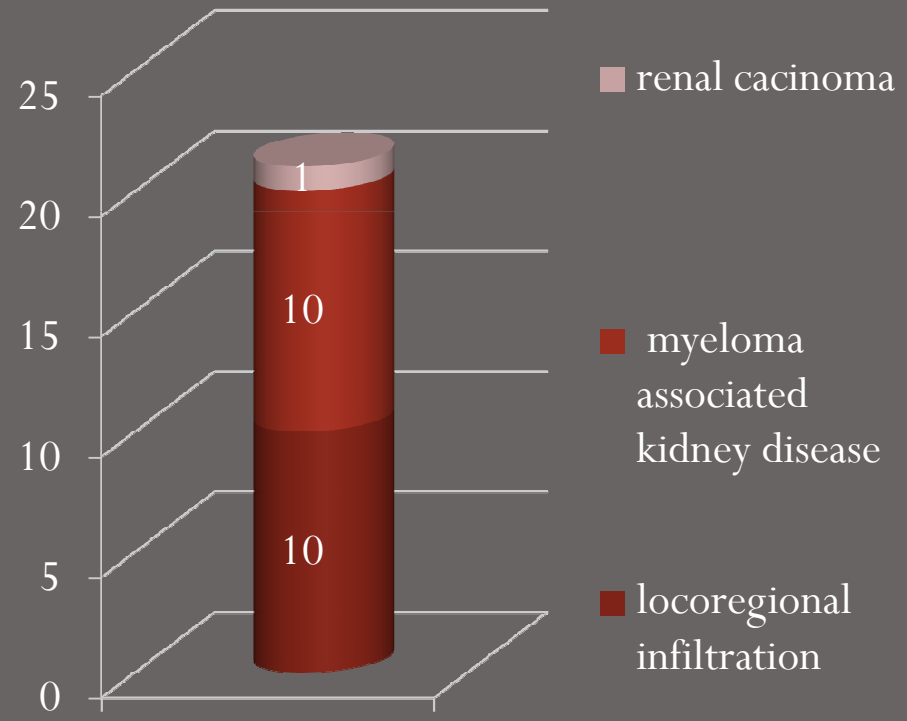


Mechanism of Renal Disease

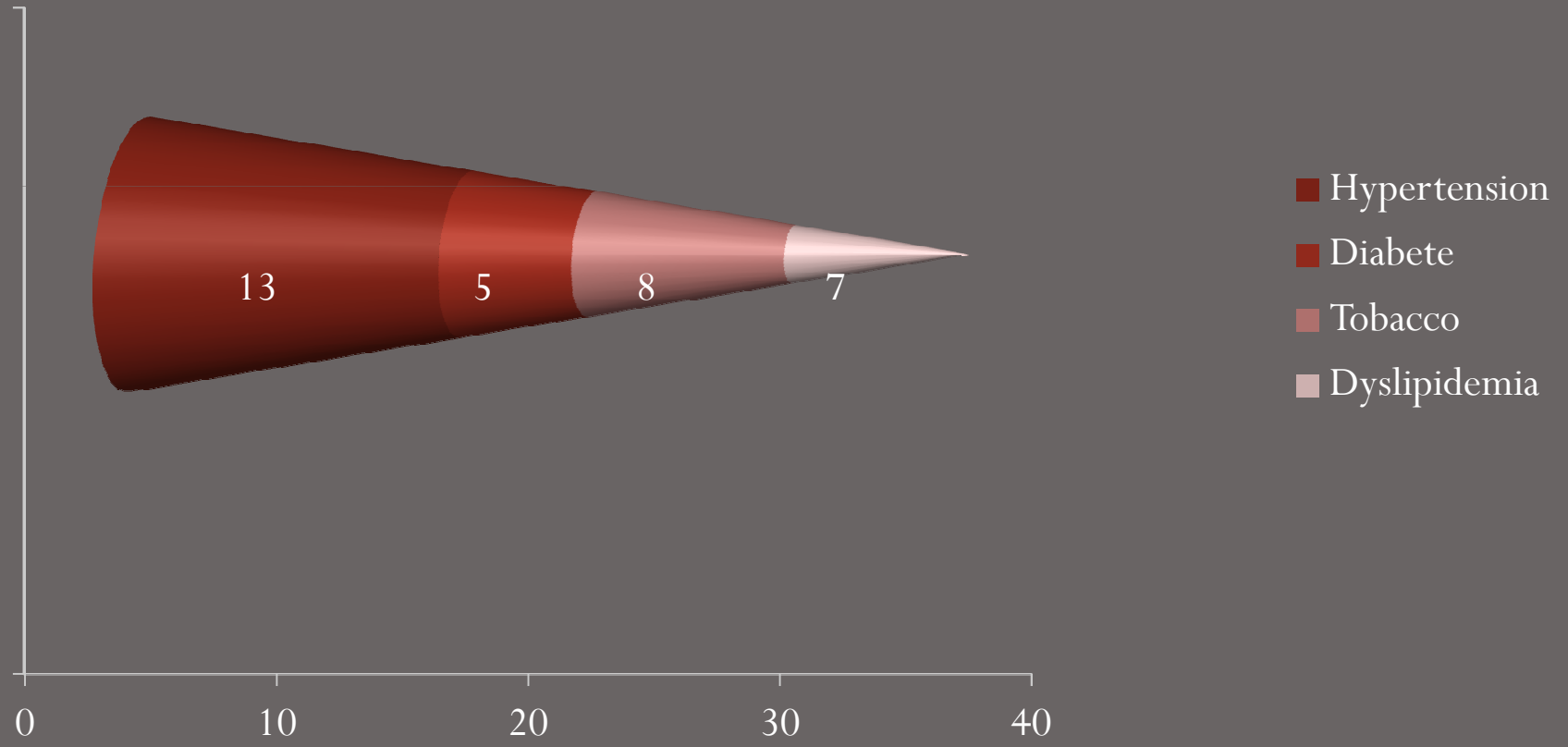
Chemotherapeutic agents Induced Renal damage

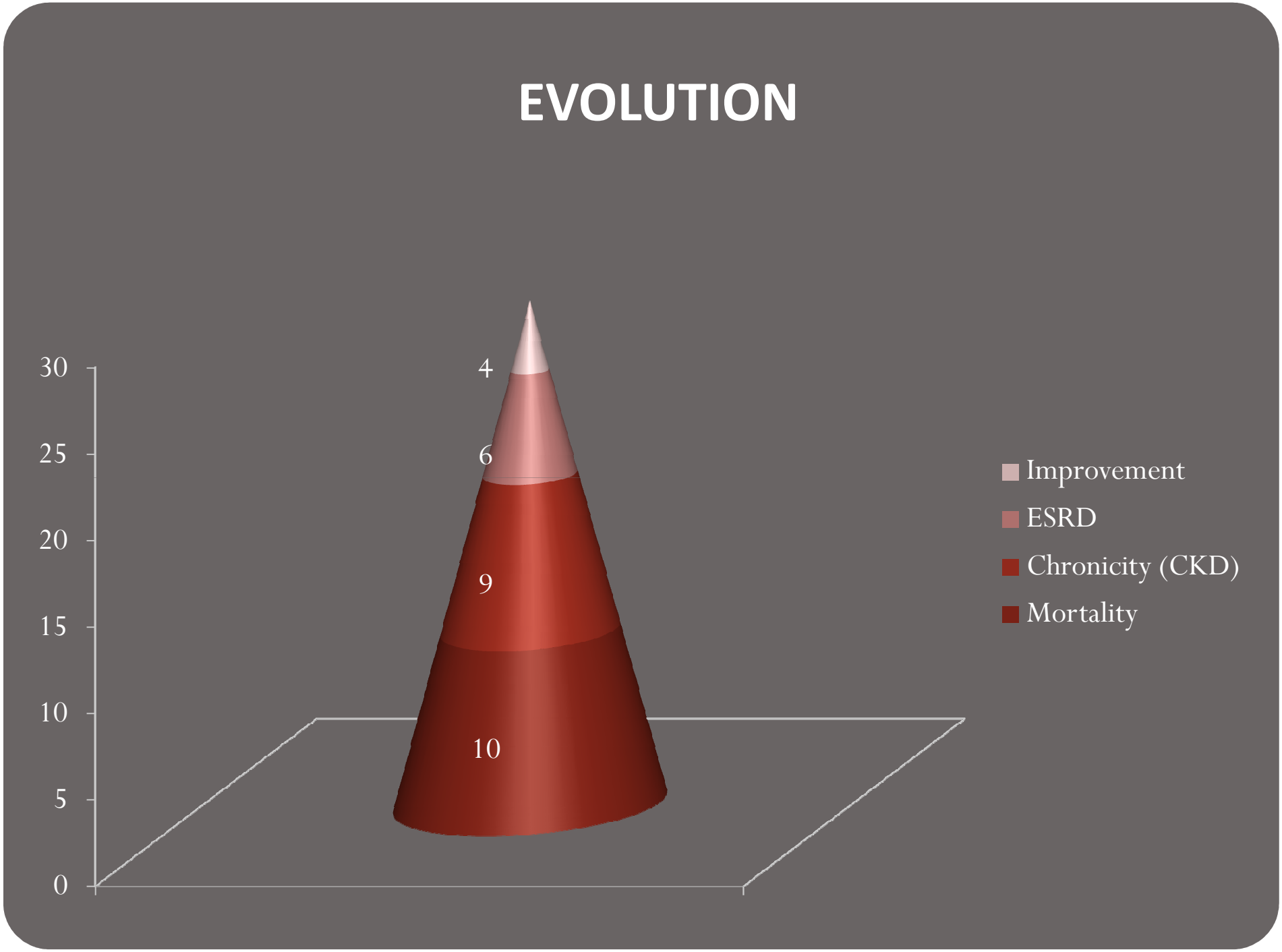


Neoplasia Direct Consequencies



Additional Risk Factors




EVOLUTION
30
25
20
15
10
5
0
4
6
9
10
Improvement
ESRD
Chronicity (CKD)
Mortality

COMMENTS:

71% of supported AKI was linked to a cancer

A female predominance 18F/ 11M

Average Age **54Years** (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 certains 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

Thanks to all hemodialysis Team who participated in that work:
Dr Rafa Debah, Dr Sfihi, Dr Rouai, Dr Amieur, Dr Allaoua,
Dr Mazouni.