

# Fibroblast Growth Factor 23 in Multiple Myeloma Patients with Renal Impairment.

Nahed Moawad Ibrahim<sup>1</sup>, Amal Mostafa ElAfifi<sup>1</sup>, Nada Shawky Rizk Abdelallim<sup>1</sup>, Nour El Hoda Hussein Abdallah<sup>1</sup>.



1 Clinical Hematology and Oncology Unit, Internal Medicine Department , Faculty of Medicine, Ain Shams University, Cairo, Egypt.

## Abstract

**CONTEXT:** Intact Fibroblast growth factor (iFGF23) is a 32 KD a factor with 251 amino acids, it is a member of FGF family; It is thought that it increases the renal excretion of phosphate and decreases vitamin D level. It is a novel factor introduced to the medical field as increased expression of iFGF23 has been reported in renal impairment and multiple myeloma(1). **OBJECTIVES:** to measure the level of serum iFGF23 in multiple myeloma patients with renal impairment and to investigate its possible predictive role in multiple myeloma patients with renal impairment. **PATIENTS AND METHODS:** 80 subjects, they will be classified into 4 groups. **Group 1:** 20 multiple myeloma patients with renal impairment (on dialysis and not on dialysis). **Group 2:** 20 multiple myeloma patients without renal impairment. **Group 3:** 30 healthy controls who will be group matched with patients for age and sex. **Group 4:**10 non multiple myeloma patients with renal impairment. **RESULTS:** Serum iFGF23 was higher in patients with multiple myeloma than healthy controls (P < 0.01). Moreover, it was higher in multiple myeloma patients with renal impairment than multiple myeloma without renal impairment (p<0.05). However, it was the highest in renal impairment non MM patients (p<0.01). There is significant direct correlation between iFGF23 and Creatinine (p<0.01) in group1, 2 and 4. Serum iFGF23 is significantly inversely proportional to eGFR (p<0.01) in group 1 and 2.

## Objectives

- to measure the level of serum iFGF23 in multiple myeloma patients with renal impairment.
- to investigate its possible predictive role in multiple myeloma patients with renal impairment.

## Background

The FGF23 axis has an important role in bone biology. This axis mediates cell-to-cell communication physiologically in many systems. Therefore, the role of FGF axis in cancer metastases needs to be studied to understand its function in bone and cell biology (2).

## Materials & Methods

**DESIGN:** cross sectional comparative study.  
**PARTICIPANTS:** 80 subjects, they will be classified into 4 groups.  
➤**Group 1:** 20 multiple myeloma patients with renal impairment (on dialysis and not on dialysis).  
➤**Group 2:** 20 multiple myeloma patients without renal impairment.  
➤**Group 3:** 30 healthy controls who will be group matched with patients for age and sex.  
➤**Group 4:**10 non multiple myeloma patients with renal impairment.  
**INTERVENTION:** Blood samples were obtained to measure the level of FGF23 by ELISA method.  
**SETTING:** Clinical Hematology and Bone Marrow Transplantation unit, Ain Shams university Hospital, Cairo, Egypt.

## Materials & Methods (Cont.)

- 1.Newly diagnosed MM patients according to international myeloma working group (IMWG) without renal impairment .
- 2.Newly diagnosed MM patients according to IMWG with renal impairment according to GFR.

Inclusion  
criteria

- 1.MM Patients on chemotherapy.
- 2.MM Patients with renal impairment due to other causes.
- 3.Patients with co-morbidity as endocrine diseases or chronic infection.

Exclusion  
criteria

## Results

- Serum iFGF23 was higher in patients with multiple myeloma than healthy controls (P < 0.01). Moreover, it was higher in multiple myeloma patients with renal impairment than multiple myeloma without renal impairment (p<0.05).
- However, it was the highest in renal impairment non MM patients (p<0.01).
- There is significant direct correlation between iFGF23 and Creatinine (p<0.01) in group1, 2 and 4. Serum iFGF23 is significantly inversely proportional to eGFR (p<0.01) in group 1 and 2.

## conclusion

iFGF23 is seen to be associated with renal disease in MM patients so it may be have a predictive value as a biomarker especially in MM patients with renal impairment. Moreover, it could be used as a targetable marker for therapeutic intervention.

## References

- 1.Martin A, Liu S, et al. Bone proteins PHEX and DMP1 regulate fibroblast growth factor FGF23 expression in osteocytes through a common pathway involving FGF receptor signaling. FASEB Journal. 2011; 25:2551- 62.
- 2.Khosravi, C.M. Culter, et al. Determination of the elimination half-life of fibroblast growth factor- 23. J Clin Endocrinal Metab.2007; 92:2374-7.