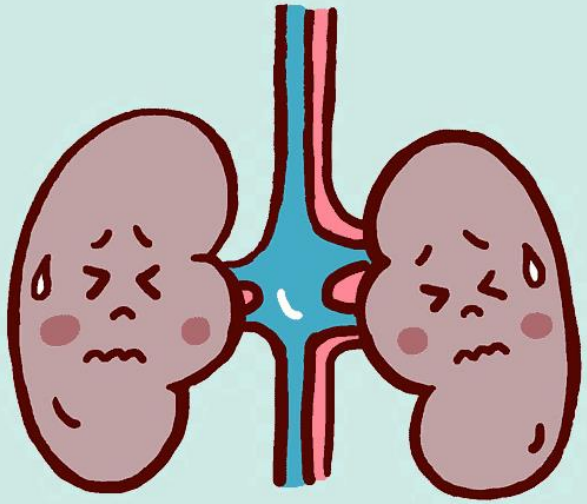
INVESTIGATION OF INDICATIONS FOR REQUESTING THE SERUM IMMUNOFIXATION ELECTROPHORESIS(IFE) TEST



Cemre Öksüz

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March, 2023

PLAN

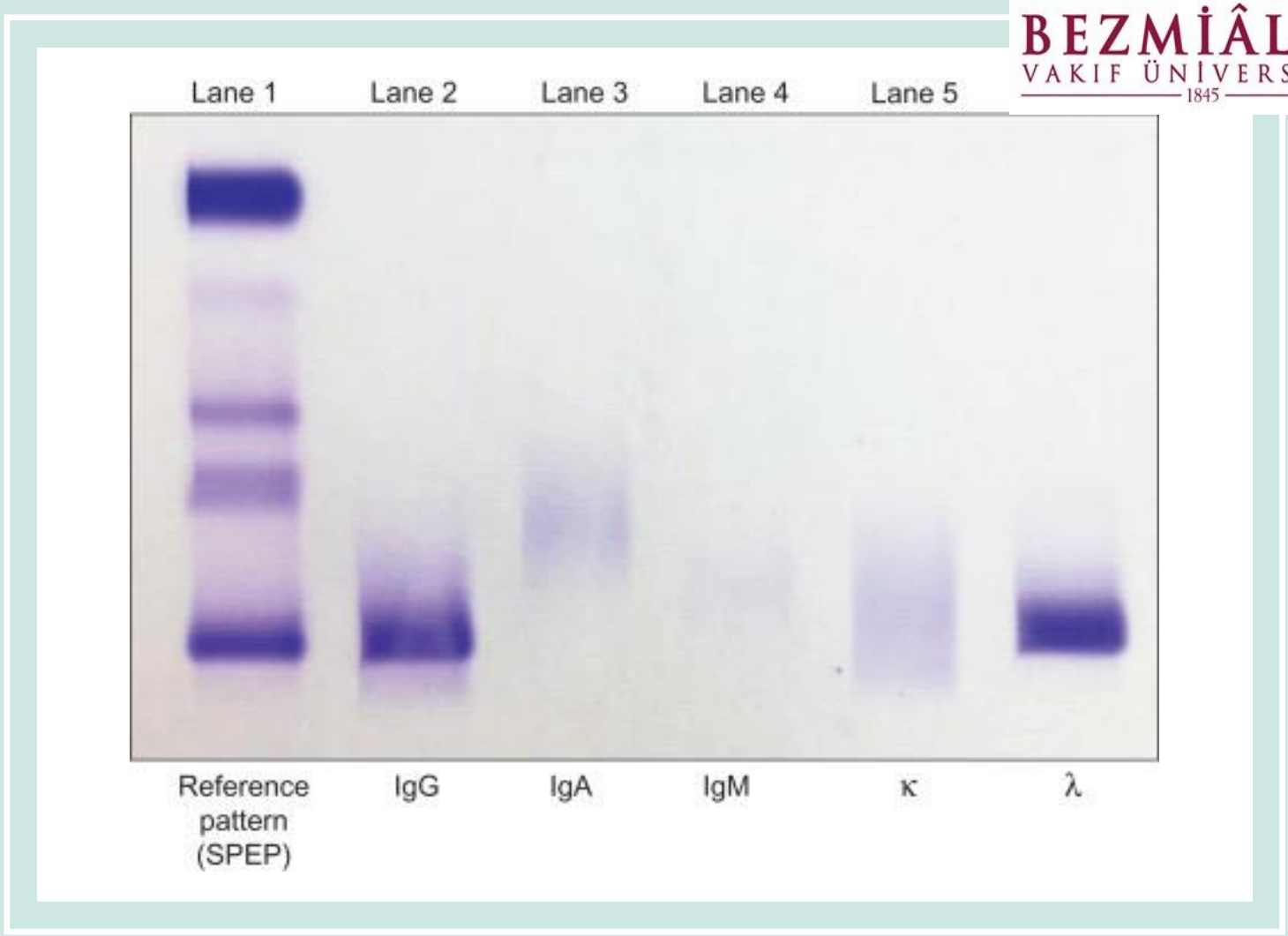
- Introduction: Plasma cell dyscrasia
- Introduction: Serum Immunofixation electrophoresis (IFE)
- Aim and importance
- Method
- Inclusion & Exclusion Criteria
- Results
- Conclusion
- References

INTRODUCTION

- **Plasma cell dyscrasia**
- Plasma cells are differentiated B-lymphocyte white blood cells capable of secreting immunoglobulin, or **antibody**.
- Dyscrasia≅ Dysfunction
- Plasma cell dyscrasias are a heterogeneous group of disorders, producing monoclonal protein, that arise from the proliferation of the monoclonal plasma cells.
- MGUS, solitary plasmacytoma, AL amyloidosis, Multipl Myeloma

SERUM IMMUNOFIXATION ELECTROPHORESIS (IFE)

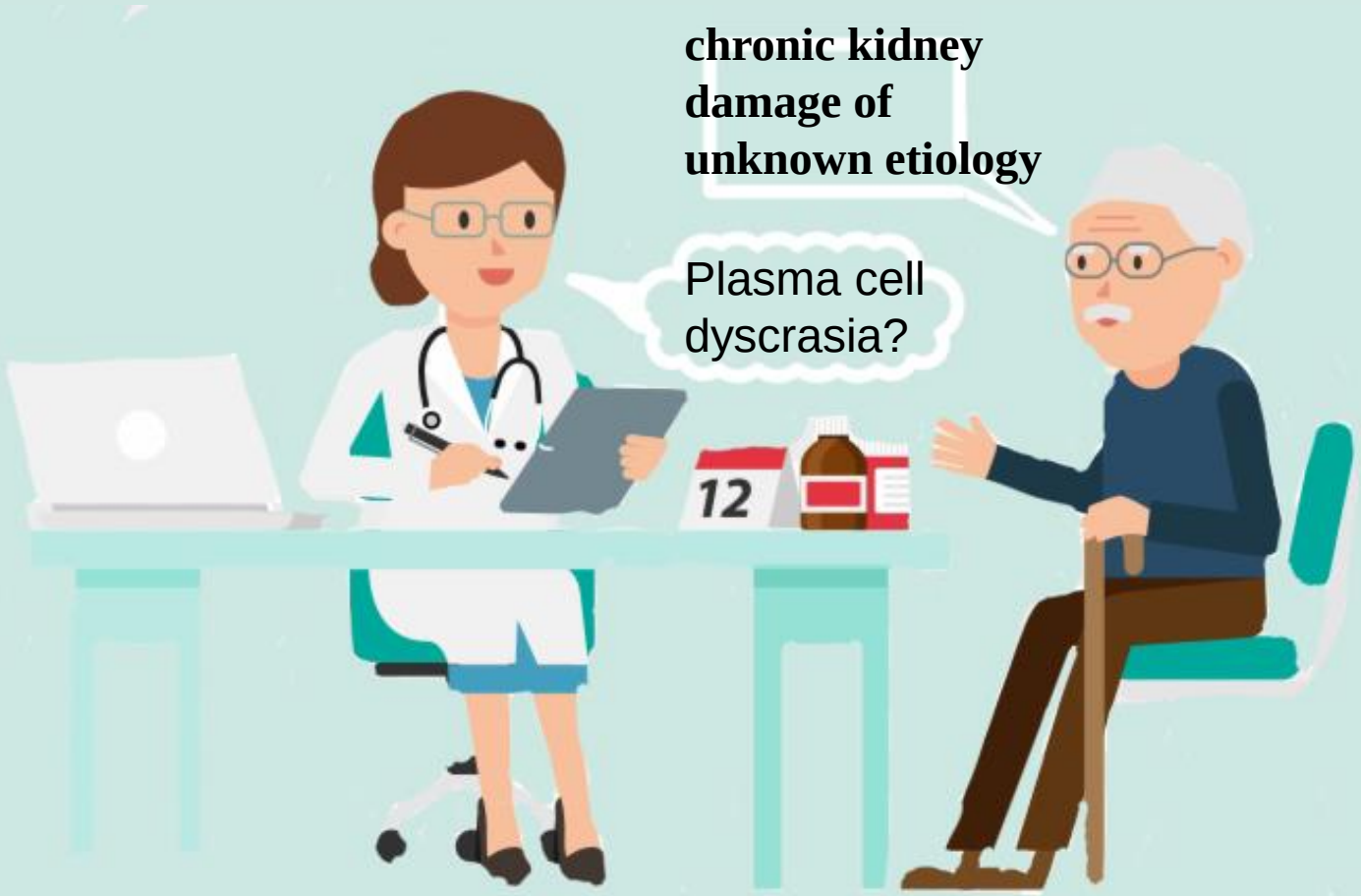
- Detection of monoclonal free immunoglobulin light chain using immunofixation electrophoresis (IFE) in serum, urine, or both is considered the most appro priate screening tool for plasma cell dyscrasias.



AIM AND IMPORTANCE

- Monoclonal gammopathies can cause different types of pathologies in kidneys and cause acute or chronic kidney damage
- Although it is relatively easy to diagnose when patients have findings such as high sedimentation rate, hypercalcemia, and pathological bone fractures that indicate monoclonal gammopathy; **kidney involvement is observed in an increasing number of patients in recent years before these findings appear.** These patients usually present as chronic kidney damage in the clinic.
- Therefore, the investigation of monoclonal gammopathies in the investigation of the cause of chronic kidney damage of unknown etiology in the practice of nephrology has become almost routine practice.

AIM AND IMPORTANCE



- This situation has given rise to a concern that this test may be unnecessarily demanded. For this reason, we aimed to predict optimum standards for IFE test based on the parameters we collected from our hospital system (such as demographic data, lab tests and medical history).

METHOD

- This study is a retrospective study. Basic demographic information and comorbidities of the patients included in the study, including age, race and gender; diabetes (DM), hypertension (HT), congestive heart failure (CHF), renal calculus, ischemic heart disease (IRD), CKD stage etc. will be recorded.
- Serum BUN, urea, creatinine levels, electrolytes, total protein, albumin, PTH, 25-OH vitamin D, ferritin, iron, TDBC, ALP, calcium, phosphorus, albumin, glucose, uric acid, hemoglobin, leukocytes, hemoglobin A1C, albuminuria, and proteinuria will be collected.
- These data will be accessed from the patients' polyclinic files and the hospital operating system (Nucleus).

Inclusion & Exclusion Criteria

Inclusion Criteria

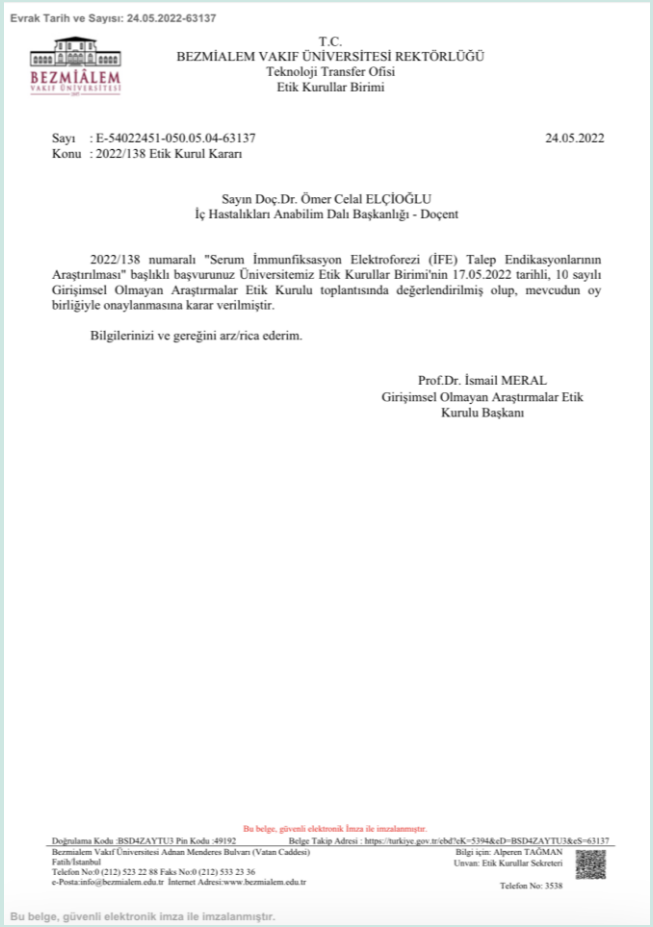
- Applied between January 01, 2015 and May 01, 2022 and IFE test was requested

Exclusion Criteria

- Age <18
- pregnant women
- patients with a known paraproteinemia

APPROVAL PROCESS

Ethics Committee Approval -> May 24th



Evrak Tarih ve Sayısı: 24.05.2022-63137

T.C.
BEZMİALEM VAKIF ÜNİVERSİTESİ REKTÖRLÜĞÜ
Teknoloji Transfer Ofisi
Etik Kurullar Birimi

Sayı : E-54022451-050.05.04-63137
Konu : 2022/138 Etik Kurul Kararı

24.05.2022

Sayın Doç.Dr. Ömer Celal ELÇİOĞLU
İç Hastalıkları Anabilim Dalı Başkanlığı - Doçent

2022/138 numaralı "Serum İmmunfiksasyon Elektroforezi (İFE) Talep Endikasyonlarının Araştırılması" başlıklı başvurunuz Üniversitemiz Etik Kurullar Birimi'nin 17.05.2022 tarihli, 10 sayılı Girişimsel Olmayan Araştırmalar Etik Kurulu toplantısında değerlendirilmiş olup, mevcudun oy birliğiyle onaylanmasına karar verilmiştir.

Bilgilerinizi ve gereğini arz/rica ederim.

Prof.Dr. İsmail MERAL
Girişimsel Olmayan Araştırmalar Etik Kurulu Başkanı

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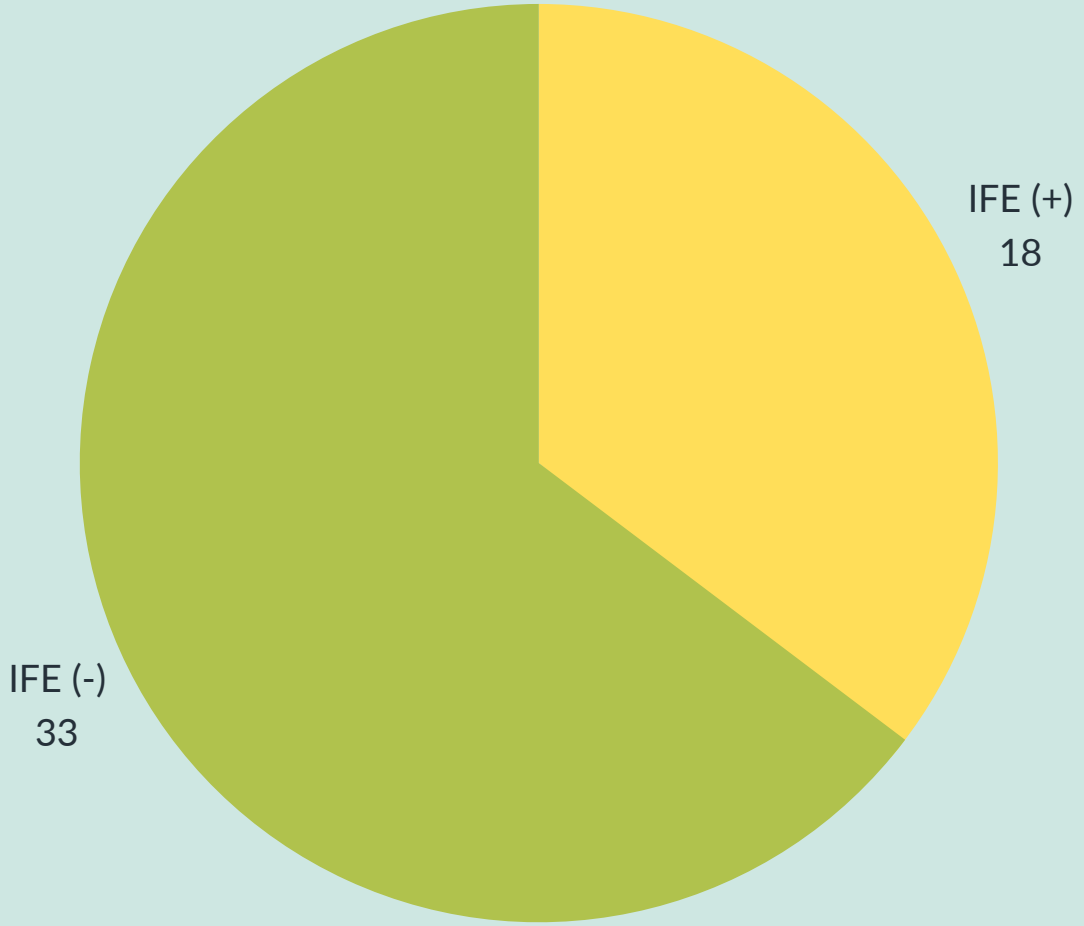
RESEARCH PROCESS

- Data collection and analyses performed until Module 6 -
  > December 2022

ANALYSİS OF DATA

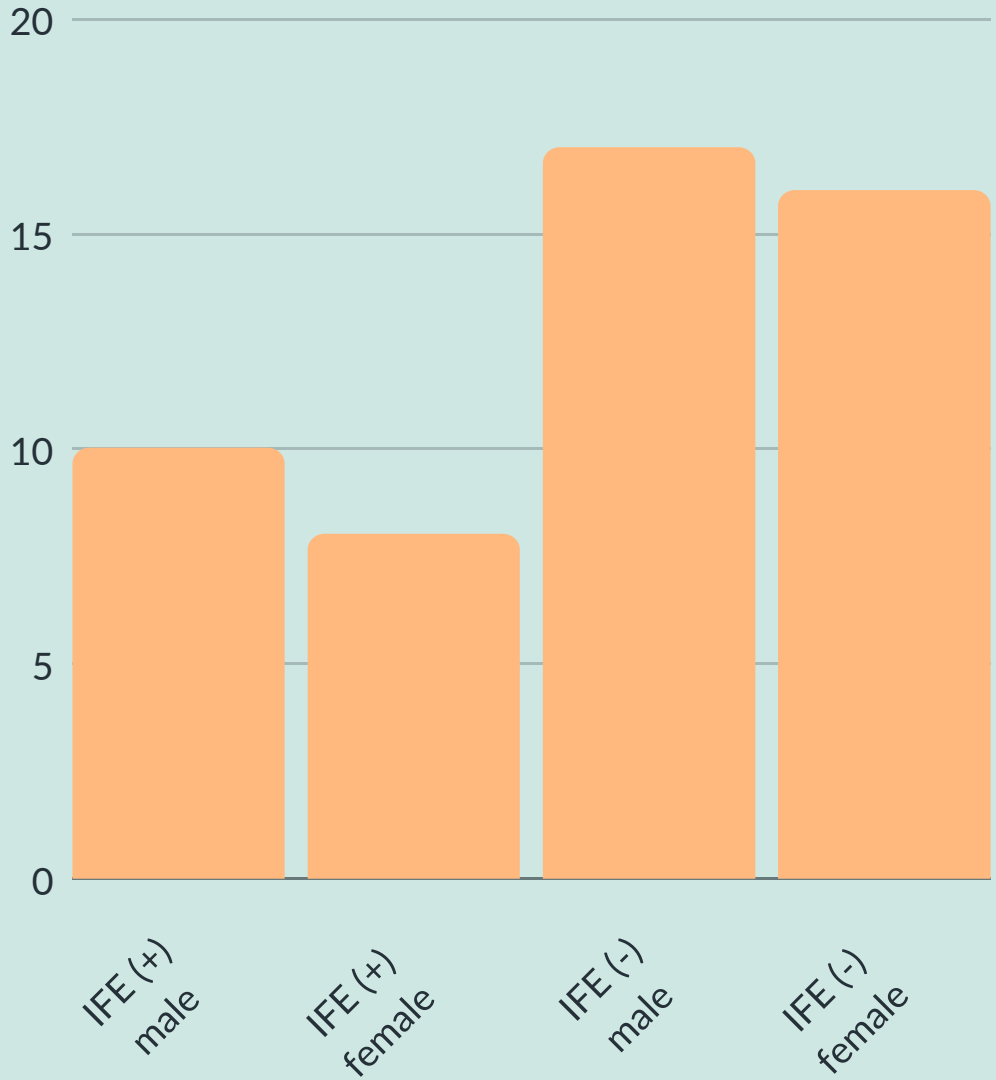
- The descriptive statistics of the qualitative variables in the study are given as numbers and percentages, and the descriptive statistics of the quantitative variables are given as mean, median, standard deviation, minimum and maximum. The conformity to the normal distribution was examined by the Shapiro Wilk test. The relationships between the qualitative variables were examined with the Fisher exact chi-square test. The Mann WhitneyU test was used to compare the mean of two independent groups. The statistical significance level was taken as 0.05 and the SPSS (version 26) package program was used in the calculations.

RESULTS



- Out of those 51 patients, those who had negative IFE test, 48.5% (16 people) were female, 51.5% (17 people) were male, 60.6% had diabetes, **51.5**% had anemia, 3% had congestive heart failure.
-

RESULTS



- Of those with positive IFE test, 44.4%(8 people) were female, 55.6%(10 people) were male, 38.9% had diabetes, **77.8**% had anemia, 16.7% had congestive heart failure. The mean age of those with positive IFE test result is 68.83±14.325 and the mean age of those with negative IFE test result is 63.45±12.34. There were no statistically significant differences between IFE positive and IFE negative test results in terms of age, albumin, ALP, Ca, Cl, CRP, eGFR, Fe, glucose averages(p=0.166; p=0.284; p=0.161; p=0.377; p=0.325; p=0.781; p=0.454; p=0.729; p=0.897). Mean hemoglobin and total iron binding capacity values of those with negative IFE test were significantly higher than those with positive IFE test (p=0.035; p=0.05;), protein in spot urine and IgG was found to be higher in patients who tested positive (p=0.05; p=0.05)

RESULTS

	grup	N	Mean	Median	Std. Deviation	Minimum	Maximum	p
yaş	0	33	63,45	67,00	12,347	23	78	0,166
	1	18	68,83	70,00	14,325	40	90	
Hb	0	33	12,2700	12,0800	2,43089	7,47	16,40	**0,035**
	1	18	10,9917	11,4950	2,27433	7,13	14,56	
TDBK	0	18	276,28	265,00	81,240	127	451	**0,050**
	1	11	228,73	227,00	66,340	113	314	
ProteinuriMG spot idrar	0	26	129,162	87,400	169,2965	,0	797,0	**0,050**
	1	10	140,340	11,750	360,7835	,0	1163,0	
ALBuri spot	0	9	1372,289	447,000	2126,7399	,0	6353,0	0,190
	1	5	802,700	22,900	1753,8111	11,8	3940,0	
IgG	0	16	1250,56	1139,00	520,622	595	2924	**0,050**
	1	13	2214,77	1386,00	2457,323	173	9116	
IgA	0	15	247,467	189,000	188,6001	83,0	719,0	**0,014**

CONCLUSION

- Mean hemoglobin was lower in patients with plasma cell dyscrasia. In addition, the total iron binding was lower; IgG and protein in spot urine was higher compared to the patients whose IFE test was found to be negative.
- Based on theseresults, it may be useful for clinical practice to order an IFE test from **chronic kidney damage of unknown etiology** with iron deficiency anemia and proteinuria.

REFERENCES

- 1. Willrich MA, Katzmann JA. Laboratory testing requirements for diagnosis and follow-up of multiple myeloma and related plasma cell dyscrasias. Clin Chem Lab Med. 2016 Jun 1;54(6):907-19. doi: 10.1515/cclm-2015-0580. PMID: 26509779.
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- 3. Mattana J, Govindappa V, Adamidis A, Kohn N. Predictors of positive immunofixation testing in patients with acute kidney injury. Am J Med Sci. 2013 Mar;345(3):185-9. doi: 10.1097/MAJ.0b013e31825396fc. PMID: 22739554.