ISO 9001 : 2008 CERTIFIED LAB

KOS Diagnostic Lab
(A Unit of KOS Healthcare)

KOS™
EXCELLENCE IN HEALTHCARE & DIAGNOSTICS

Dr. Vinay Chopra
MD (Pathology & Microbiology)
Chairman & Consultant Pathologist

Dr. Yugam Chopra
MD (Pathology)
CEO & Consultant Pathologist



| | | | |
|---|---|---|---|
| **NAME** | **: Mr. PARVEEN KUMAR GUPTA** | | |
| **AGE/ GENDER** | : 67 YRS/MALE | **PATIENT ID** | : 1729909 |
| **COLLECTED BY** | : | **REG. NO./LAB NO.** | **: 012501210025** |
| **REFERRED BY** | : | **REGISTRATION DATE** | : 21/Jan/2025 11:31 AM |
| **BARCODE NO.** | : 01524185 | **COLLECTION DATE** | : 21/Jan/2025 12:13PM |
| **CLIENT CODE.** | : KOS DIAGNOSTIC LAB | **REPORTING DATE** | : 21/Jan/2025 01:55PM |
| **CLIENT ADDRESS** | : 6349/1, NICHOLSON ROAD, AMBALA CANTT | | |

| Test Name | Value | Unit | Biological Reference interval |
|---|---|---|---|

## CLINICAL CHEMISTRY/BIOCHEMISTRY

### UREA

| | | | |
|---|---|---|---|
| UREA: SERUM<br>*by UREASE - GLUTAMATE DEHYDROGENASE (GLDH)* | 26.45 | mg/dL | 10.00 - 50.00 |

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| **CREATININE** | | | |
| CREATININE: SERUM<br>*by ENZYMATIC, SPECTROPHOTOMETRY* | 1.21 | mg/dL | 0.40 - 1.40 |

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## SPECIAL INVESTIGATIONS

### IMMUNOTYPING/IMMUNOFIXATION ELECTROPHORESIS (IFE) QUALITATIVE: SERUM

**ELECTROPHORETIC ZONE**

| Test Name | Value | Unit | Biological Reference interval |
|---|---|---|---|
| IMMUNOGLOBIN-G (IgG): SERUM<br>*by IMMUNOFIXATION - AGAROSE GEL ELECTROPHORESIS* | Absent | | ABSENT |
| IMMUNOGLOBIN-M (IgM): SERUM<br>*by IMMUNOFIXATION - AGAROSE GEL ELECTROPHORESIS* | Absent | | ABSENT |
| IMMUNOGLOBIN-A (IgA): SERUM<br>*by IMMUNOFIXATION - AGAROSE GEL ELECTROPHORESIS* | Absent | | ABSENT |
| KAPPA - FREE LIGHT CHAIN: SERUM<br>*by IMMUNOFIXATION - AGAROSE GEL ELECTROPHORESIS* | Absent | mg/dL | 629.0 - 1350.0 |
| LAMBDA - FREE LIGHT CHAIN: SERUM<br>*by IMMUNOFIXATION - AGAROSE GEL ELECTROPHORESIS* | Absent | mg/dL | 313.0 - 723.0 |
| MYELOMA (M) BAND/SPIKE<br>*by IMMUNOFIXATION - AGAROSE GEL ELECTROPHORESIS* | Absent | gm/dL | |
| **INTERPRETATION** | NO MONOCLONAL BAND SEEN. | | |

***INTERPRETATION:***

| BAND IN SERUM PROTEIN ELECTROPHORESIS | SERUM IMMUNOFIXATION | | RESULT |
|---|---|---|---|
| | Anti heavy chain antisera (IgG/ IgM/IgA) | Anti Light chain Kappa/Lambda | |
| REMARK 1: 1 BAND PRESENT | + | + | Presence of monoclonal |
| REMARK 2: 1 BAND PRESENT | - | + | 1.Light chain disease,suggest urine Immunofixation<br>2.IgD or IgE disease<br>3.Multiple bands in lambda region indicates polymerised form |
| REMARK 3: 1 BAND PRESENT | + | - | Heavy Chain Disease |
| REMARK 4: FAINT BAND PRESENT | Faint Band | - | Cryoglobulin |
| REMARK 5: 2 BANDS PRESENT | 2 band with same or different anti-heavy chain sera | 2 band with same different anti-light chain sera | 1. Biclonal gammopathy<br>2. Paraprotein monomer/polymer of Immunoglobulins). |

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| Test Name | Value | Unit | Biological Reference interval |
|---|---|---|---|

1. High resolution serum protein electrophoresis does not reveal the presence of any abnormal bands. No 'M' spike seen.
2. Immunofixation (IFE) identifies polyclonal gamma globulin to consist mainly of IgG, kappa and Lambda with fair amount of IgA.
Also available: Serum IgG, IgA and IgM levels (Quantitative).

**NOTE:** Immunofixation is a Qualitative assay which cannot quantify monoclonal protein if detected.

**COMMENT:**

Immunofixation electrophoresis (IFE) is used for immunotyping of monoclonal proteins which identifies the monoclonal immunoglobulin heavy-chain (gamma, alpha, mu) and/or light-chain type (kappa or lambda). It is generally recommended that both serum Protein electrophoresis (SPEP) and IFE be used as a screening panel because IFE is more sensitive than SPEP. IFE is not only recommended as part of the initial screening process but also for confirmation of complete response to therapy.

**USES:**

1. Identification of monoclonal immunoglobulin heavy and light chains.
2. Documentation of complete response to therapy

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## PROTEIN ELECTROPHORESIS: SERUM

| Test Name | Value | Unit | Biological Reference interval |
|---|---|---|---|
| TOTAL PROTEINS: SERUM<br>*by MIGRATION GEL ELECTROPHORESIS* | 7.02 | gm/dL | 6.20 - 8.00 |
| ALBUMIN: SERUM<br>*by MIGRATION GEL ELECTROPHORESIS* | 4.41 | gm/dL | 3.50 - 5.50 |
| ALPHA 1 GLOBULIN<br>*by MIGRATION GEL ELECTROPHORESIS* | 0.27 | gm/dL | 0.11 - 0.40 |
| ALPHA 2 GLOBULIN<br>*by MIGRATION GEL ELECTROPHORESIS* | 0.74 | gm/dL | 0.43 - 1.03 |
| BETA 1 GLOBULIN<br>*by MIGRATION GEL ELECTROPHORESIS* | 0.53 | gm/dL | 0.30 - 0.59 |
| BETA 2 GLOBULIN<br>*by MIGRATION GEL ELECTROPHORESIS* | 0.27 | gm/dL | 0.20 - 0.53 |
| GAMMA GLOBULIN<br>*by MIGRATION GEL ELECTROPHORESIS* | 0.79 | gm/dL | 0.75 - 1.80 |
| MYELOMA (M) BAND/SPIKE<br>*by MIGRATION GEL ELECTROPHORESIS* | NO MONOCLONAL BAND SEEN | gm/dL | |
| **ADVICE** | **KINDLY CORRELATE CLINICALLY** | | |

***INTERPRETATION:***

1.Serum protein electrophoresis is commonly used to identify patients with multiple myeloma and disorders of serum proteins.
2.Electrophoresis is a method of separating proteins based on their physical properties. the pattern of serum protein electrophoresis results depends on the frations of 2 types of protein : albumin and globulin (alpha 1 alpha2, beta and gamma.)
3.A homogeneous spike-like peak in a focal region of the gamma-globulin zone indicates a monoclonal gammopathy.
4.Monoclonal gammopathies are associated with a clonal process that is malignant or potentially malignant, including multiple myeloma, Waldenstrom macroglobulinemia, solitary plasmacytoma, smoldering multiple myeloma, monoclonal gammopathy of undetermined significance, plasma cell leukemia, heavy chain disease, and amyloidosis.
5.M-protein (in the gamma region) level greater than 3 g/dL should be interpreted along with other radiologic and haematological findings to arrive at a diagnosis of Multiple myeloma and must not be considered in isolation.
6.Occasionally M protein may appear as a narrow spike in the beta or alpha2 regions also.
7.Up to one fifth of patients with Myeloma may have an M-protein spike of less than 1 g /dL.
8.Hypogammaglobulinemia on serum protein electrophoresis occurs in about 10% of patients with multiple myeloma who do not have a serum M-protein spike.
9.Most of these patients have a large amount of Bence Jones protein (monoclonal free kappa or lambda chain) in their urine, wherein urine protein electrophoresis should be performed. Monoclonal gammopathy is present in up to 8 percent of healthy geriatric patients.

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| Test Name | Value | Unit | Biological Reference interval |
|---|---|---|---|

**NOTE:**
The following conditions require serum immunofixation to confirm monoclonality or to differentiate monoclonal and polyclonal disoders.
1.A well defined "M" band.
2.Faint band .
3.Chronic inflammatory pattern (decreased albumin, increased alpha, increased gamma fractions)
4.Isolated increase in any region with an otherwise normal pattern.
5.Shouldering of albumin peak along anodal or cathodal side may be seen with lipoproteins, drugs, bilirubin or radiological contrast.

*** End Of Report ***

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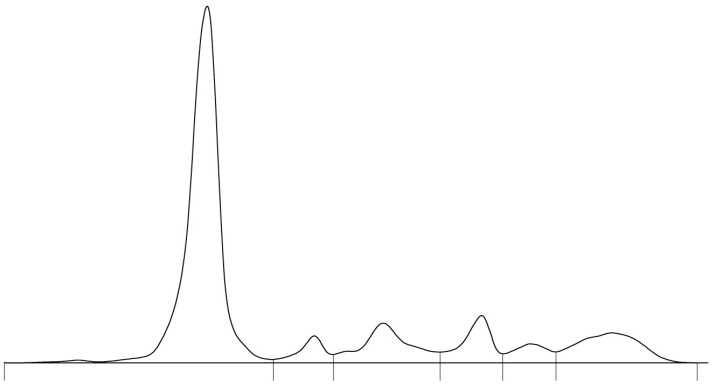
| Investigation | Observed Value | Unit | Biological Reference Interval |
|---|---|---|---|

# PROTEIN ELECTROPHORESIS

Name: **PARVEEN KUMAR GUPTA**
Sample : **13**
Sex : **M**

Date: **1/26/2025**
ID: **0531167503**
Age : **67**



A/G Ratio: **1.69**
T. P.: **7.02** g/dL

| Fractions | % | | Ref. % | Conc. | Ref. Conc. |
|---|---|---|---|---|---|
| **Albumin** | **62.8** | | 55.8 - 66.1 | **4.41** | 3.57 - 5.42 |
| **Alpha 1** | **3.9** | | 2.9 - 4.9 | **0.27** | 0.19 - 0.40 |
| **Alpha 2** | **10.5** | | 7.1 - 11.8 | **0.74** | 0.45 - 0.96 |
| **Beta 1** | **7.6** | > | 4.7 - 7.2 | **0.53** | 0.30 - 0.59 |
| **Beta 2** | **3.9** | | 3.2 - 6.5 | **0.27** | 0.20 - 0.53 |
| **Gamma** | **11.3** | | 11.1 - 18.8 | **0.79** | 0.71 - 1.54 |

*Signature*

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