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Correlative Study in Diabetic Patients for Blood Glucose Level and their Kidney Functions

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ABSTRACT

Diabetes mellitus (DM) and hypertension are now widely recognized as the leading causes of end-stage renal disease. Because DM is so common among ESRD patients, there is a great need to understand more about how to avoid and manage it. This paper attempt to make a Correlative Study in Diabetic Patients for Blood Glucose Level and their Kidney Functions conducted at Jaypee Multi-Specialist Hospital Noida laboratory medicine. Correlation between high glucose and high creatinine levels were made in the study and it was indicated that the level of glucose from the samples is higher than that of creatinine levels. The lower, higher and normal creatinine level were duly examined in the study. The samples for the study were selected from the general patient enrolment list obtained from the Jaypee Multi Specialist Hospital Noida Laboratory Medicine. However, the test was conducted during the six months' project work and random sampling procedure was used in selecting the samples. The results indicate that based on age distribution, the percentage of patients with higher glucose is higher than the percentage of normal creatinine level, likewise the percentage of patients with high creatinine level is more than that of normal levels respectively. Hence it was concluded that based on the correlation made the percentages of patients with high level of glucose is higher than that of patients with high creatinine levels.

Keywords : Diabetes mellitus (DM), hypertension, Blood Glucose, Creatinine

I. INTRODUCTION

Renal failure increases the requirement for insulin in diabetic patients, because DM is a metabolic disease that induces renal failure. The rising diabetes incidence in India, which already has over 77 million diabetics, is expected to lead to a rise in diabetes complications.2, 3, 4 This research done with the objective , attempt to make a Correlative Study in

Diabetic Patients for Blood Glucose Level and their Kidney Functions .

Diabetes mellitus is a condition in which the pancreas no longer produces enough insulin or c ells stop responding to the insulin that is produced, so that glucose in the blood cannot be absorbed into the cells of the body. Symptoms include frequent urination, lethargy, excessive thirst, and hunger. The treatment includes changes in diet, oral medications, and in some cases, daily injections of insulin.

According to Encyclopaedia Britannica (2020) Diabetes Mellitus is a disorder of carbohydrates metabolism characterized by impaired ability of the body to produce or respond to insulin and thereby maintained proper level of sugar in the blood.6

Every cell in the human body needs energy in order to function. The body's primary energy s ource is glucose, a simple sugar resulting from the digestion of foods containing carbohydrate s (sugars and starches). Glucose from the digested food circulates in the blood as a ready energy source for any cells that need it. Insulin is a hormone or chemical produced by cells in the pancreas, an organ located behind the stomach. Insulin bonds to a receptor site on the outside of cell and acts like a key to open a doorway into the cell through which glucose can enter. Some of the glucose can be converted to concentrated energy sources like glycogen or fatty acid s and saved for later use. 5, 6 when there is not enough insulin produced or when the doorway no longer recognizes the insulin key, glucose stays in the blood rather entering the cells.

The body will attempt to dilute the high level glucoses in the blood, a condition called hyper glycaemia, by drawing water out of the cells and into the bloodstream in an effort to dilute the sugar and excrete it in the urine. It is not unusual for people with undiagnosed diabetes to be constantly thirsty, drink large quantities of water, and urinate frequently as their bodies try to get rid of the extra glucose. This creates high levels of glucose in the urine. This condition can be life threatening if left not treated which can lead to coma and death.7

1.2 Concept of Creatinine

Creatinine was first identified in 1832 when Michel Eugene Chevreul isolated it from the basified water-extract of skeletal muscle. He later named the crystallized precipitate after the Greek word for meat. In 1928, creatinine was shown to exist in equilibrium with creatinine. Studies in the 1920s showed that consumption of large amounts of creatinine did not result in its excretion. This result pointed to the ability of the body to store creatinine, which in turn suggested its use as a dietary supplement.

In 1912, Harvard University researchers Otto Folin and Willey Glover Denis found evidence that ingesting creatinine can dramatically boost the creatinine content of the muscle. In the late 1920s, after finding that the intramuscular stores of creatinine can be increased by ingesting creatinine in larger than normal amounts, scientists discovered creatinine phosphate, and determined that creatinine is a key player in the metabolism of skeletal muscle. The substance creatinine is naturally formed in vertebrates.7

The discovery of phosphocreatine was reported in 1927. In the 1960s, creatinine kinase (CK) was shown to phosphorylate ADP using phosphocreatine (PCr) to generate ATP. It follows that ATP, not PCr is directly consumed in muscle contraction. CK uses creatinine to "buffer" the ATP/ADP ratio. 4

While creatinine's influence on physical performance has been well documented since the early twentieth century, it came into public view following the 1992 Olympics in Barcelona. An August 7, 1992 article in The Times reported that Linford Christie, the gold medal winner at 100 meters, had used creatinine before the Olympics. An article in Bodybuilding Monthly Named Sally Gunnell, who was the gold medallist in the 400-meter hurdles, as another creatinine user. In addition, The Times also noted that 100meter hurdler Colin Jackson began taking creatinine before the Olympics.

Creatinine is a waste product that comes from the normal wear and tear on muscles of the body.

Everyone has creatinine in their bloodstream. Creatinine is a waste product from the normal breakdown of muscle tissue. As creatinine is produced, it's filtered through the kidneys and excreted in urine. Doctors measure the blood creatinine level as a test of kidney function. The kidneys' ability to handle creatinine is called the creatinine clearance rate, which helps to estimate the glomerular filtration rate (GFR) -- the rate of blood flow through the kidneys.8

II. Aims and Objectives

The aim of this research study is to correlate diabetic patients of blood glucose level and their kidney functions.

The objectives of this research work are mention in the following connections:

I. To correlate the blood glucose level and blood creatinine level (kidney functions) in diabetic patients

II. To determine the glomerular filtration rates (GFR) in diabetic patients.

III. MATERIALS AND METHODOLOGY

This research study was conducted in Jaypee Hospital Noida and one hundred and fifty (150) samples selected were used for this research study. However, the samples were randomly selected from the total population of diabetic patient in Jaypee Hospital Noida.

3.1 Determination of Creatinine

Determination of creatinine can be done based on certain levels as normal level, high level and low level respectively as shown in the following descriptions.

 Determination of Normal Creatinine

Determination of normal blood creatinine levels vary and depend on age, race, gender, and body size.

Normal serum creatinine ranges are:7

• 0.6–1.1 mg/dl in women and adolescents aged 16 and older

• 0.8–1.3 mg/dl in men and adolescents aged 16 and older

• 0.2 or more in infants, depending on muscle development

Serum creatinine ranges are lower for women because women have less muscle mass and, thus, a lower rate of creatinine formation and excretion.8

Normal blood creatinine levels also vary by race. For non-Hispanic blacks, the average blood creatinine is 1.25 mg/dl in men and 1.01 mg/dl in women. In non-Hispanic whites the mean blood creatinine levels are 1.16 mg/dl in men and 0.97 mg/dl in women, and in MexicanAmericans the values are 1.07 mg/dl in men and 0.86 mg/dl in women.7

 Determination of High Level Creatinine

A high creatinine level is typically anything over 1.3 (depending on age, race, gender, and body size).

Certain conditions may cause a person to have higher than normal levels of creatinine.

• People with only one kidney may have a normal creatinine level of about 1.8 or 1.9.

• Creatinine levels of 2.0 or more in infants and 5.0 or more in adults may indicate severe kidney damage.

• People who are dehydrated may have elevated creatinine levels.8,9

 Determination of Low Level Creatinine

Low creatinine levels are often seen in patients with low muscle mass and are not usually considered a serious medical problem.

3.2 MATERIALS

Creatinine. Standard solutions were prepared daily by dilution of a stock solution containing 400 mg. creatinine/100 ml. of 0 1N-HCl. The stock solution was stored at 0° and was never kept for longer than 4 weeks.

Picric acid. An aqueous solution, saturated at room temperature (18-20%), was prepared from picric acid (A.R.) which had been recrystallized twice from water and satisfied the criteria of purity proposed by Folin & Doisy (1917).

The solution was kept in dark bottles and was made up at intervals of a few days.

Other reagents. Sodium hydroxide, (A.R.) 2-5N. Sodium tungstate, (A.R.) a 10% (w/v) solution of Na2WO4, 2H20. Sulphuric acid, (A.R.) 0-66N. Phosphate buffer, 1 m, pH 7 0, Oxalic acid,

(A.R.) saturated aqueous solution. Lloyd's reagent hydrated aluminum silicate.9

3.3 METHODS

Make sure that you follow each and every step very carefully in order to have a successful test.

Also, take care of all the precautions that are written in the precautions section below this one. Once you have the reagent, the equipment, and you have taken care of the precautions, we are good to go with the test.7,9

1. To 40 ml of the solution containing creatinine were added 2-0ml of alkaline picrate solution and the colour was allowed to develop for 20 minutes in a water bath at 20 + 0-20.
2. The alkaline picrate solution was made up immediately before use by adding 1 vol. of sodium hydroxide to 5 vol. of picric acid.
3. The optical density of the developed colour was measured at a wavelength of 520 ml using water as reference optical density.

These are all the steps from the test. For determinations in plasma or serum filtrates or in diluted urines, two standard solutions were included with each batch. All results were expressed in terms of creatinine. 10

3.4 NORMAL VALUE OF CREATININE

Normal levels of BUN are between 10 to 20 mg/dl for an adult and 5 to 18 mg/dl for a child. Normal creatinine levels are between .5 to 1.1 mg/dl for an adult female and .6 to 1.2 mg/dl for an adult male. Creatinine levels are lower in young children and the elderly as a result of reduced muscle mass. With normal kidney function, serum creatinine levels should remain constant. Only in renal disorders will creatinine be abnormally elevated. Creatinine phosphate is used as part of skeletal muscle contraction; its daily production depends on muscle mass. Once creatinine is used by the muscles it becomes creatinine and is excreted by the kidneys. To obtain creatinine values in the blood we need a sample of it, and so it will be extracted by a nurse via venepuncture. During the reading of the test results we will find the results of the creatinine test in the biochemistry section.7

It is possible that before taking the sample your doctor may ask you to temporarily stop taking certain drugs that can change the outcome of the analysis. It is the case of: nephrotoxic drugs, NSAIDs, aminoglycosides, heavy chemotherapeutic drugs, among others. 11

To read the results you must take into account that women often have lower creatinine levels compared to men because typically women have less muscle mass. So normal blood creatinine values are:

- women: between 0.6 and 1.1 mg / dl.
- men: between 0.7 and 1.3 mg / dl

In cases of creatinine in urine this requires a urine sample collected over 24 hours in a special container. The right thing is to urinate in one bottle from when the individual wakes up and until bedtime. The sample must be kept in a refrigerator until delivery to the laboratory.

It is important to inform the doctor who has requested the analysis if you are taking any medication such as antibiotics, cimetidine or cisplatin; as they may interfere with the results.

Still, do not stop treatment if your doctor has not instructed you directly to do so.

However, creatinine level may differ according to certain aspects such as age, race, gender among other criteria necessary in determining the creatinine level of individuals of the same species, that is human being in particular 12,13

The values of creatinine in urine (24-hour display) may vary from 500 to 2000 mg / day. The results

depend on the age and lean body mass. The normal range by gender can be interpreted as follows:

- in women: 11 to 20 mg per kg body mass.
- in men between 14 and 26 mg per kg body mass.

IV. RESULTS AND DISCUSSSION

The study was aimed to determine and correlate the between the creatinine and glucose levels among the diabetic patients. The results and discussion for the study are made in the following connections:

Table 1 : Blood sugar and Creatinine level in Patient

SERIAL NO.	HOSPITAL NO.	NAME OF PATIENT	AGE	FASTING BLOOD SUGAR	CREATININE LEVEL
1	JHN000303330	SATYA WATI	55	179	0.72
2	JHN000026699	RAKESH JAIN	31	93	0.85
3	JHN000217569	SURENDRA KUMAR	42	93	0.77
4	JHN000294315	SHYAM WATI	43	149	0.84
5	JHN000094921	RAMA RANI	38	102	0.84
6	*JHN000020693*	*DR VEENA KHERA*	*46*	*93*	*0.77*
7	JHN000321544	NANDAN SINGH	32	94	0.84
8	JHN000325178	ASHOK KUMAR	27	94	0.76
9	JHN000243307	DAYAWATI	49	93	0.51
10	JHN000215411	SUBHASH RAM	40	90	0.93
11	JHN000329640	VIRENDRA	58	107	1.21
12	JHN000298681	K.K SINGH	67	166	1.02
13	JHN000297049	ASHA	67	142	0.62
14	JHN000238592	KAVYA CHAUHAN	66		0.93
15	JHN000301585	KANHA	61	110	0.59
16	JHN000301569	SUNNY YADAV	68	95	0.67
17	JHN000301877	RUDRA SACHDEVA	51	102	0.71

18	JHN000301692	ANUBHAV	38	95	0.68

19	JHN000301701	PRIYADARSHANA PANDEY	38	105	1.01
20	JHN000301942	PRASHANT SINGH	31	90	0.64
21	JHN000298255	ALAMRI ALI	45	91	0.79
23	JHN000201523	ANAND SINGH	35	91	0.62
24	JHN000268156	RITA KAPOOR	48	88	0.79
25	JHN000301714	AVANTIKA SINGH	25	93	0.84
26	JHN000299585	MEENASHI	33	90	0.67
27	JHN000301563	AAYANSH PARASHAR	57	89	0.91
28	JHN000028287	MANJIT CHHINA	34	85	0.75
29	JHN000301942	PRASHANT SINGH	41	105	1.05
30	JHN000034973	MEENU BAIJAL	33	93	0.76
31	JHN000302423	BUDHI CHETRI	70	95	0.68
32	JHN000302565	VEENU PANDEY	24	98	0.81
33	JHN000090841	SIDDHARTH	52	258	1.14
34	JHN000016341	RITU VERMA	57	278	0.66
35	JHN000270286	TRIVENDRA SHISHODIA	59	108	0.88
36	JHN000303058	SADAF	29	115	0.66
37	JHN000162459	LALIT KUMAR	57	126	0.88
38	JHN000303379	PAARAV TYAGI	38	103	0.63
39	JHN000303246	SIDHU	49	89	0.68
40	JHN000302926	ADAWAL ASSINNT	33	91	1.27
41	JHN000075819	JYOTI	27	89	0.93
42	JHN000218048	SUMAN LATA	30	91	0.75

43	JHN000303612	ADHARV MAHAJAN	64	159	1.12
44	JHN000303396	BHAVIK RAJ SINGH	54	105	0.98
45	JHN000303827	NITIKA ARORA	41	111	0.91
46	JHN000303546	SARITA	44	97	0.68
47	JHN000258118	KOUSHIKI SHARMA	55	100	0.95
48	JHN000303614	CHAVI LAWANIYA	28	167	0.72
49	JHN000303952	JYOTI SINGH	59	98	0.76
50	JHN000295317	NISHIKHA	42	100	0.89
51	JHN000214105	MANDANI	30	111	0.99
52	JHN000304265	NAVJYOTI DAHIYA	57	111	0.64
53	JHN000100409	YASH PRIYA	62	100	0.55
54	JHN000183233	DIVITA	50	188	0.89
55	JHN000304838	NISHA SINGH	35	97	0.97
56	JHN000019597	SHIVANGI SHARMA	67	88	1.01
57	JHN000304722	ABDULKAREEM SULAIMAN	35	111	0.71
58	JHN000304350	SURABHI GUPTA	45	98	067
59	JHN000299652	NITYA SINGH	37	101	0.82
60	JHN000305336	MANISHA GROVER	33	106	0.76
61	JHN000304265	NAVJYOTI DAHIYA 2	51	94	1.67
62	JHN000305640	SARTHAK DUBEY	86	113	1.01
63	JHN000162327	PRABHA KIRAN	32	101	0.67

64	JHN000305452	DEEPIKA ATTRY	54	109	0.97
65	JHN000231592	NAMAN SHARMA	27	107	0.97
66	JHN000304740	SAPNA BALOUT	25	88	0.89
67	JHN000112160	NIRMALA GUPTA	79	111	1.21
68	JHN000205046	SHAURYA JOSHI	53	98	1.02
69	JHN000306444	AMMAR SALEH	37	101	0.89
70	JHN000305642	NEHA YADAV	60	106	0.28
71	JHN000306666	MOHAMMED ABDELMAGEED	29	94	1.02
72	JHN000194654	ARIHANT KUMAR	35	89	1.05
73	JHN000306800	RAGHAD HAMEED	66	113	0.92
74	JHN000306093	SHOAIB MAHMUD	41	101	0.91
75	JHN000306548	VANSH	20	91	1.23
76	JHN000306623	MINTA	32	102	0.79
77	JHN000299197	SHEETAL SHARMA	44	78	0.79
78	JHN000307390	KESHAV JHA	47	96	1.07
79	JHN000306308	POOJA 2ND	39	91	1.21
80	JHN000186662	INAAYA MISHRA	36	119	0.98

92	JHN000272056	YAAVISHA MEHTA	64	120	1.02
93	JHN000285772	SHARIBA	65	124	0.98
94	JHN000306463	RAJNI	40	98	0.92
95	JHN000035388	MONIKA KUMAR	32	103	0.83
96	JHN000255131	SUDESH GUPTA	24	99	1.02
97	JHN000306683	SAKSHI KHARE	69	92	0.73
98	JHN000302926	ADAWAL ASSINTA	40	96	1.03

99	JHN000308519	SAKSHAM KAUSHIK	32	94	0.88
100	JHN000142252	GOURI AMRITA	24	105	0.68
101	JHN000307237	AGOROM TREASURE	69	93	0.61
102	JHN000202955	SUNAINA KUMAR	27	100	0.93
103	JHN000309538	TANRYGULY KOMEKOV	37	88	0.74
104	JHN000281623	FAIJAN ULLAH	43	182	1.03
105	JHN000309727	MEENAKSHI THAKUR	48	88	0.88
106	JHN000309964	ALKA GUPTA	59	94	0.67
107	JHN00072274	TAJ UDDIN AHAMAD	36	98	0.61
108	JHN000309855	TANU BHARDWAWJ	54	108	1.13
109	JHN000298793	YOGINDRA KUMAR	40	112	0.99
110	JHN000221125	HIMANSHI	37	113	0.97
111	JHN000291576	RAGHAV CHAU	40	94	0.91
112	JHN000309271	VIVIN LAVANIYA	37	113	1.14
113	JHN000080731	KALPANA ODDEPALI	22	98	0.85
114	JHN000310129	DR SWATI THAKUR	47	93	0.52
115	JHN000310615	SHWETA MEHROT	56	93	0.92
116	JHN000309931	DEEPIKA	46	97	0.98
117	JHN000310129	UTKARSH SHARMA	59	93	0.67
118	JHN000310199	RIDHIMA	53	97	0.86

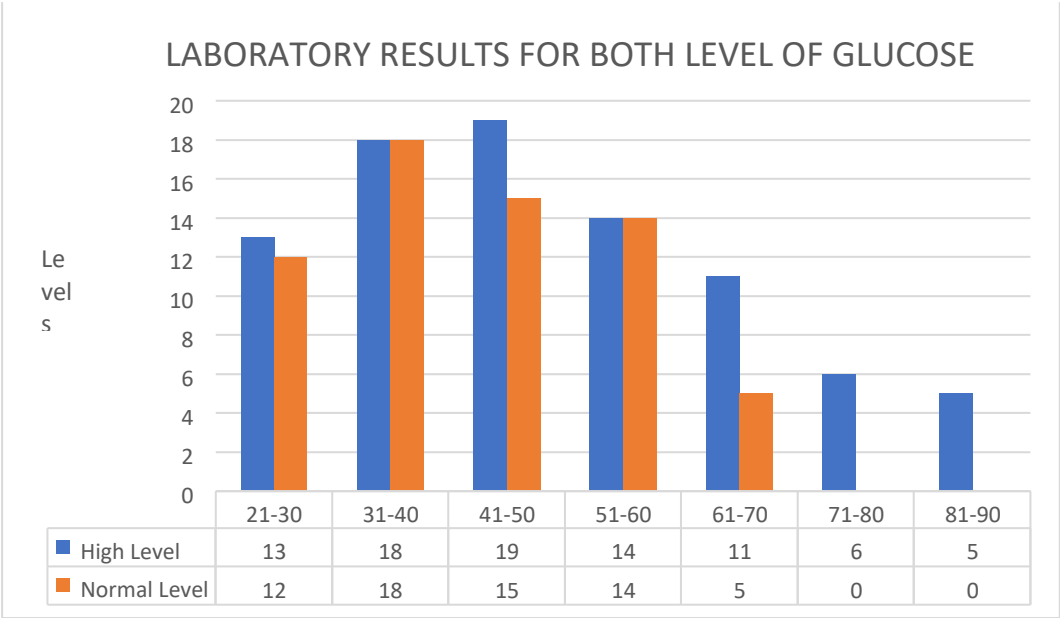
119	JHN000242782	PREM GUPTA	45	93	0.86
120	JHN000297814	ARNAV SETHI	44	91	0.81
121	JHN000305056	ARPITA ARYA	65	107	0.83
122	JHN000312277	AMAN DEEPA KAUR	48	144	0.83
123	JHN000280017	KAMAL KANT	29	110	0.91

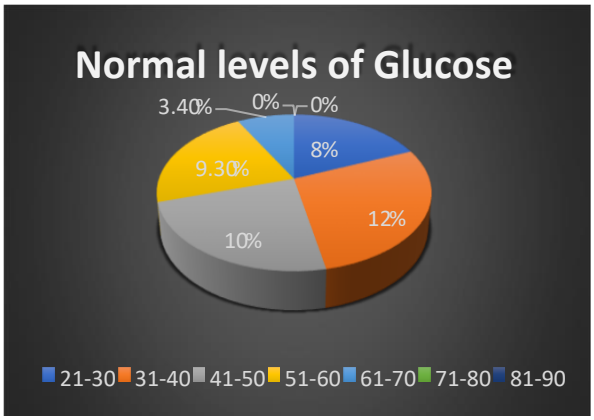
124	JHN000304899	KHAMA SARKAR	28	99	0.88
125	JHN000312936	REYANSH BHARD	59	91	0.52
126	JHN000313062	BASIM MALAT	35	86	0.62
127	JHN000311004	MUNESH	57	91	1.18
128	JHN000225138	NISHA KALIDHA	34	114	0.79
129	JHN000212633	ANSHUMAN SHAKYA	73	195	0.99
130	JHN000313227	DEEPIKA	36	110	0.93
131	JHN000312691	NAINI GUPTA	57	104	0.92
132	JHN000194698	DM BAHL	73	137	0.83
133	JHN000283097	MEDHAVANI	36	195	1.02
134	JHN000306868	NANITA GUPTA	40	99	0.73
135	JHN000313837	AIDEN BASIL	53	110	0.98
136	JHN000313465	INDIRA RASTOGI	54	137	1.02
137	JHN000313567	TRIPTI CHTURVEDI	61	143	0.74
138	JHN000107809	KRTVI TREHAN	26	105	1.03
139	JHN000313754	MANJU KASHYAP	41	91	0.88
140	JHN000314226	SUHANA	33	97	0.69
141	JHN000314394	NADIA DHUMAD	33	112	0.85
142	JHN000142911	SHASHI MALIK	40	104	0.75
143	JHN000192221	AYUSHI CHAUHA	53	98	1.03

144	JHN000010495	GURDEEP SINGH	54	108	0.88
145	JHN000140268	SANCHAN JAIN	61	102	0.68
146	JHN000271542	NIRPENDRA KUMAR	26	90	0.68
147	JHN000315159	AASHVI AHLUWA	44	129	1.13
148	JHN000315175	SHOURYAN VERMA	41	130	0.99
149	JHN000315280	PARANJAL	33	129	0.97
150	JHN000171035	USHA KEJRIWAL	33	112	0.91

Table 2 : Laboratory Results For Glucose Level

Age(s). Percentages	Normal Level	Percentages	High Level	
21-30	12	8%	13	8.6%
31-40	18	12%	18	12%
41-50	15	10%	19	12.6%
51-60	14	9.3%	14	9.3%
61-70	5	3.4%	11	7.4%
71-80	0	0%	6	4%
81-90	0	0%	5	3.4%
TOTAL:	**64**	**42.7%**	**86**	**57.3%**





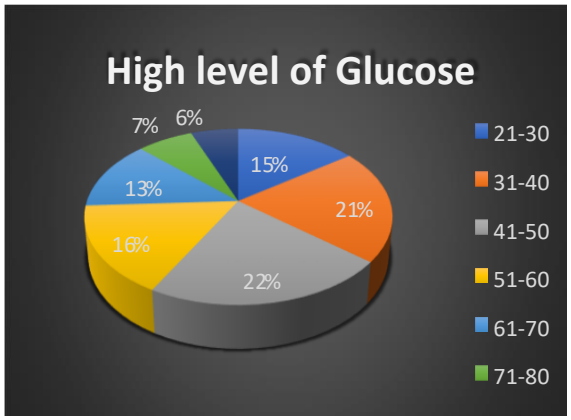
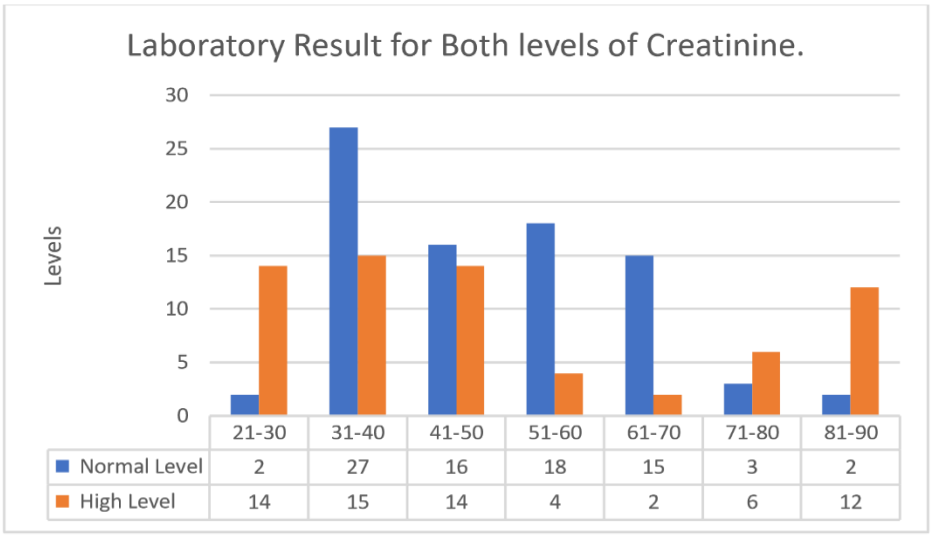
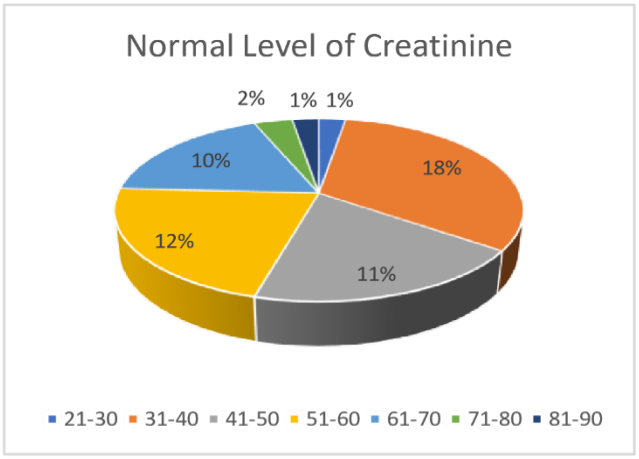
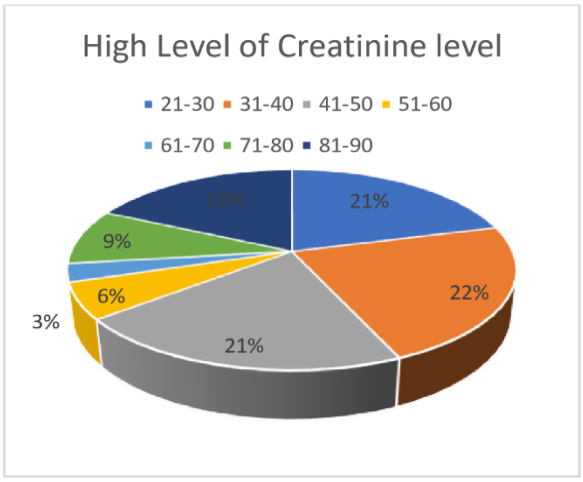


TABLE 3 : LABORATORY RESULTS FOR CREATININE LEVEL

	Age(s).	Normal Level	Percentages	High Level	Percentages
	20-30	2	1.4%	14	9.3%
	31-40	27	18%	15	10%
	41-50	16	10.7%	14	9.3%
	51-60	18	12%	4	2.6%
	61-70	15	10%	2	1.3%
	71-80	3	2%	6	4%
	81-90	2	1.4%	12	8%
TOTAL:	83	55.5%	67	44.5%	







In the table 4.1 above,150 patients were selected as sample for the study which was conducted at Jaypee Multi-Specialist Hospital Laboratory Medicine, sector 128 Noida. However, age distribution of ten years' interval was used. The result indicates that patients within 21-30 years have 8%(12) normal level of glucose while 8.6% (13) have high level of glucose respectively. The table also show that 12% (18) of the patient have normal level of glucose and 12%(18) of the patients also have high level of glucose within the range of 31-40 years, it is also indicated that 10% (15) of the patients within 41-50 have normal glucose level and 12.6% (19) of the patients have high glucose level, where as 9.3% (14) of the patients have normal level of glucose and 9.3% (14) of the patients have high level of glucose. Moreover, 3.4% (5) of the patients have normal glucose level and (11) 7.4% of the patients have high glucose level within

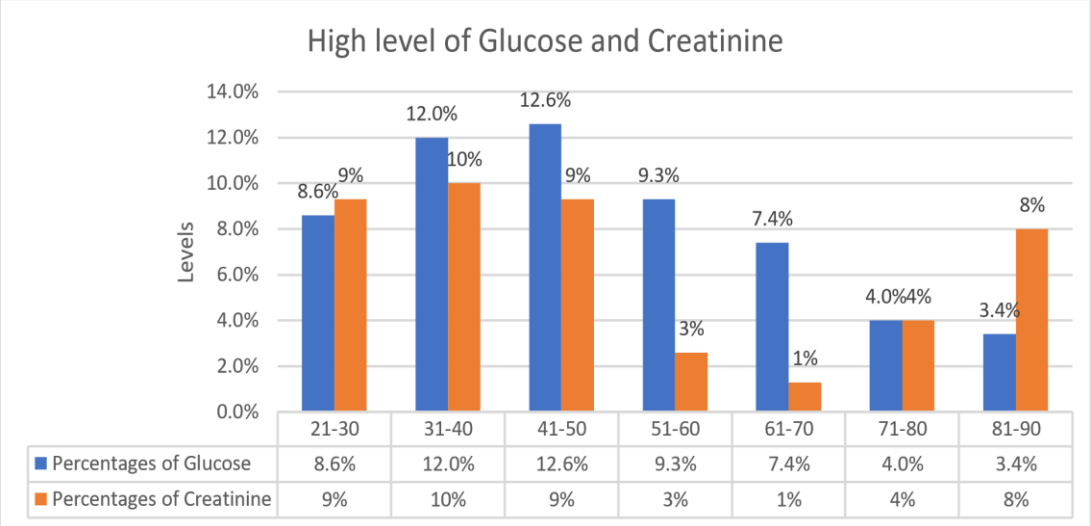
61-70 years' interval. The table further indicate that there are no patients who have normal glucose level i.e. 0% and 4% (6) of the patients have high level of glucose under 71-80 years' interval, lastly the table shows that within the 81-90 years' interval there is no patients with normal glucose level and only 3.4% (5) of the patients have high level of glucose. However, the test was conducted by all gender both male and female. The samples were randomly selected from the population of tested patients using randomly technique for selection of sample. The result obtained were used for the discussion.

Discussion

From the total 4.2 above, sample sent to the laboratory at Jaypee Multi-Specialist Hospital Laboratory Medicine, sector 128 Noida, 150 were randomly selected as sample for this study. The table shows the percentages of patients with normal creatinine level and percentages of patients with high level of creatinine based on ten years in table ratio. Thus, the table shows that 1.4% (2) of the patients within the range of 20-30 years have normal creatinine level and 9.3% (14) of the patients within this range have high creatinine level. It furthers indicate that 18% (27) of the patients have normal creatinine level and 10% (15) of the patients have high creatinine level falling under 31-40 years' interval. The table also indicate that 10.7% (16) of the patients have normal creatinine level and 9.3% (14) of the patients have high creatinine level respectively within 41-50 years' interval. While, 12% (18) of the patients are within normal creatinine level where as 2.6% (4) of the patients are within high level of creatinine under interval of 51-60 respectively. From the 61-70 years, 10% (15) of the patients have normal creatinine level and 1.3% (2) of the patients have high creatinine level, while 71-80 years shows that only 2% (3) of the patients have normal level of creatinine and 4% (6) of the patients have high creatinine level. Lastly, the table indicates that 1.4% (2) of the patients have normal creatinine level and 8% (12) of the patients have high creatinine level within 81-90 years' interval as well. Therefore, the data shows the results obtained from the sample selected from the total number of samples conducted in the laboratory and the results were duly discuss using percentage level of each interval choose for the study.

TABLE 4.3 : CORRELATION BETWEEN GLUCOSE LEVEL AND CREATININE LEVEL

Age(s).	Percentage of High Glucose	Percentage of High Creatinine
20-30	8.6%	9.3%
31-40	12%	10%
41-50	12.6%	9.3%
51-60	9.3%	2.6%
61-70	7.4%	1.3%
71-80	4%	4%
81-90	3.4%	8%
TOTAL	57.3%	44.5%



In comparison from the discussion made so far, the table 4.3 above indicate the results obtained from the correlation between high glucose level and high creatinine level based on ten years' interval. The table shows that the results obtained from the analysis made on high glucose level among the patients indicates that 57.3% of the patients have high glucose level while, 44.5% of the patients have high creatinine level respectively.

V. CONCLUSION

In correlation, the results indicated that the percentages 57.3% (86) of patients with high glucose level are higher than the percentages 44.5% (67) of the patients with high creatinine level. Thus, high glucose level is more than the creatinine level among the patients as obtained from the samples of the study. It is therefore concluding that high glucose level is more found among the patients than the creatinine level as shown in the results.

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