**Data Analysis:**

Data were analyzed using SPSS 21.0 statistical software. Descriptive statistics (frequencies, percentages, mean, standard deviation, median and inter-quartile range) were used to describe the categorical and quantitative variables. Student's t-test for independent samples was used to compare the mean values of quantitative variables in relation to the categorical outcome variable. Karl Pearson correlation coefficient was used to quantify the relationship between two quantitative variables. Pearson's Chi-square test was used to observe an association and Odds ratio was used to quantify an association between categorical study and outcome variables. A p-value of ≤ 0.05 and 95% confidence intervals were used to report the statistical significance and precision of results.

**Results:**

Out of 881 type 2 diabetic patients, there were 439 (49.8%) males and the mean age all study subjects was 63 years. The mean age of diagnosis of diabetes was 49.27 years. The mortality percentage among these patients was 14%. The distribution of other clinical characteristics was shown in Table1. The comparison of mean values of study variables in relation to the current status ( alive & dead) shows , the mean age of the diabetic patients who have died is higher than mean age in the diabetic patients who were alive and the difference is statistically significant and 95% Confidence Interval (4.96, 9.72)also indicates statistically significant difference in the mean age. And mean age at diagnosis of diabetes pf the patients who had dead is higher than the mean age at diagnosis of diabetes of alive patients and the difference is statistically significant(<0.001) and 95% Confidence Interval (0.91, 5.57) does not overlap with null value of no difference. Mean duration of diabetes ( in years) of patients who had died is higher than the mean duration of diabetes of alive patients and the difference is statistically significant (p<0.001). Also mean GFR among the dead is higher than the mean GFR in the alive patients and the difference is statistically significant (p<0.001). But here is no difference in mean values between dead and alive for the study variables, BMI, Cholesterol, and FBS. (Table 2)

There is statistically significant positive correlation between serum creatinine and duration diabetes (p<0.0001). That is, as duration of diabetes is increasing the serum creatinine values of diabetic patients also increasing. There is statistically significant negative correlation between GFR and duration of diabetes(<0.0001). That is, as duration of diabetes is increasing the GFR values of diabetic patients are decreasing. And there is no correlation between Cholesterol and duration of diabetes; also between FBS values and duration of diabetes.(Table 3)

The association of categorical study variables with outcome ( alive/dad) shows that the variables: Nephropathy (OR=2.02, 95%CI=1.37,2.96),proteinuria(OR=2.19, 95% CI=1.49 , 3.23) Acute coronary syndrome[ACE] (OR=2.14, 95%CI=1.45,3.16),, Myocardial infarction (MI) (OR=3.75, 95%CI=2.53,5.55), Neuropathy (OR=1.80, 95%CI=1.21,2.69, Stroke (OR=15.40, 95%CI=9.95,23.84 are associated with current status of the patient(mortality) and the association is statistically significant( P<0.001). That is, the odds of mortality in those diabetic patients who had nephropathy is 2.02 times higher when compared with the diabetic patients who did not have nephropathy. Similarly, the odds of mortality is 2.19 times higher those who had proteinuria, 2.14 times higher those who had ACS, 3.75 times higher those who had MI, 1.80 times higher who had neuropathy and 15.40 times higher in those patient who had stroke.(Table 4)

The other variables Gender, obesity, family history of diabetes, diet therapy, OHA, insulin, cataract, retinopathy, blindness, hypertension, diabetic foot and amputation were not found to be statistically significantly associated with the mortality of these diabetic patients.

**Table 1: Socio demographic and clinical characteristics of Type-2 diabetic patients (n=881)**

|  |  |
| --- | --- |
| **Variable** |  |
|  | **Mean (sd)** |
| Age, | 63.04(12.7) |
| Age at diagnosis of diabetes | 49.27(12.3) |
| cholesterol | 4.27(1.1) |
| BMI | 30.08(5.0) |
| Serum creatinine | **Median(IQR)**  88(74) |
| GFR | 72.74(59) |
| Duration of diabetes | 13.0(12) |
| FBS | 5.80(2) |
|  | **N( % )** |
| Gender (male) | 439(49.8) |
| Family history of diabetes (yes) | 360(40.9) |
| Diet therapy (yes) | 629(7.14) |
| OHA(oral hypoglycemic agents)(yes) | 795(90.2) |
| Insulin therapy (yes) | 37(4.2) |
| Cataract (yes) | 273(31.0) |
| Retinopathy (yes) | 149(16.9) |
| Blindness (yes) | 14(1.6) |
| Hypertension(yes) | 660(74.9) |
| Nephropathy(yes) | 316(35.9) |
| Proteinuria (yes) | 348(39.5) |
| Acute coronary syndrome[ACE](yes) | 398(44.8) |
| Myocardial infarction (MI)(yes) | 256(29.1) |
| Neuropathy(yes) | 235(26.7) |
| Stroke(yes) | 173(19.6) |
| Diabetic foot (yes) | 66(7.5) |
| Amputation(Yes) | 34(3.9) |
| Current status ( Dead) | 123(14.0) |

**Table 2: Comparison of Mean values of study variables in relation to current status of Type-2 Diabetic patients.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Current status** | | **Mean difference** | **t-value** | **p-value** | **95% CI of difference of mean** |
| **Alive**  **(mean)** | **Dead**  **(mean)** |
| Age | 62.01 | 69.35 | 7.339 | 6.056 | <0.001 | 4.961 , 9.717 |
| Age at diagnosis of diabetes | 48.82 | 52.07 | 3.243 | 2.732 | 0.006 | 0.913 , 5.573 |
| Duration of diabetes | 13.27 | 17.46 | 4.181 | 6.468 | <0.001 | 2.912 , 5.450 |
| BMI | 30.15 | 29.64 | -0.51 | -1.168 | 0.244 | -1.371 -, 0.351 |
| Serum creatinine | 131.33 | 219.52 | 88.189 | 4.021 | <0.001 | 44.810 , 131.568 |
| GFR | 78.15 | 56.85 | -21.294 | -5.241 | <0.001 | -29.268 , -13.320 |
| Cholesterol | 4.25 | 4.35 | 0.094 | 0.917 | 0.359 | -.108 , .297 |
| FBS | 7.34 | 7.60 | 0.269 | 0.745 | 0.456 | -0.439 , 0.977 |

**Table 3: Correlation (r-value) between duration of diabetes and clinical variables of Type -2 diabetic patients**

|  |  |  |
| --- | --- | --- |
| **Clinical variable** | **Duration of diabetes**  **( “r-value”)** | **p-value** |
| Serum creatinine | 0.289 | <0.0001 |
| GFR | -0.455 | <0.0001 |
| Cholesterol | 0.008 | 0.806 |
| FBS | 0.019 | 0.573 |

**Table 5. Association of categorical study variables with current status of Type-2 diabetic patients**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | **Current status (%)** | | **χ2 value** | **p-value** | **OR** | **95% CI of OR** |
| Dead | Alive |
| Gender  Male  Female | 66(15.0)  57(12.9) | 373(85.0)  385(87.1) | 0.838 | 0.413 | 1.195 | 0.816 , 1.751 |
| Obesity  Yes  No | 105(14.1)  18(13.4 | 642(85.9)  116(86.6) | 0.037 | 0.848 | 1.054 | 0.616 , 1.804 |
| Family history of diabetes  Yes  No | 60(16.7)  63(12.1) | 300(83.3)  458(87.9) | 3.709 | 0.054 | 1.454 | 0.992 , 2.131 |
| Diet therapy  Yes  No | 89(14.1)  34(13.5) | 540(85.9)  218(86.5) | 0.065 | 0.799 | 1.057 | 0.691 , 1.617 |
| OHA(oral hypoglycemic agents)  Yes  No | 116( 14.6)  7(8.1) | 679(85.4)  79(91.9) | 2.689 | 0.101 | 1.928 | 0.868 , 4.281 |
| Insulin therapy  Yes  No | 5(13.5)  118(14.0) | 32(86.5)  726(86.0) | 0.006 | 0.936 | 0.961 | 0.367 , 2.517 |
| Cataract  Yes  No | 44(16.1)  79(13.0) | 229(83.9)  529(87.0) | 1.530 | 0.216 | 1.287 | 0.862 , 1.919 |
| Retinopathy  Yes  No | 30(20.1)  93(12.7) | 119(79.9)  639(87.3) | 5.688 | 0.017 | 1.732 | 1.098 , 2.732 |
| Blindness  Yes  No | 4(28.6)  119(13.7) | 10(71.4)  748(86.3) | 2.528 | 0.112 | 2.514 | 0.776 , 8.146 |
| Hypertension  Yes  No | 91(13.8)  32(14.5) | 569(86.2)  189(85.5) | 0.066 | 0.797 | 0.945 | 0.611 , 1.460 |
| Nephropathy  Yes  No | 62(19.6)  61(10.8) | 254(80.4)  504(89.2) | 13.136 | <0.0001 | 2.017 | 1.373 , 2.962 |
| Proteinuria  Yes  No | 69(19.8)  54(10.1) | 279(80.2)  479(89.9) | 16.478 | <0.0001 | 2.194 | 1.492 , 3.226 |
| Acute coronary syndrome[ACE]  Yes  No | 75(19.0)  48(9.9) | 320(81.0)  438(90.1) | 15.057 | <0.0001 | 2.139 | .  1.448 , 3.158 |
| Myocardial infarction (MI)  Yes  No | 68(26.6)  55(8.8) | 188(73.4)  570(91.2) | 47.701 | <0.0001 | 3.749 | 2.533 , 5.547 |
| Neuropathy  Yes  No | 46(19.6)  77(11.9) | 189(80.4)  569(88.1) | 8.406 | 0.004 | 1.799 | 1.205 , 2.685 |
| Stroke  Yes  No | 83(48.0)  40(5.6) | 90(52.0)  668(94.4) | 207.357 | <0.0001 | 15.401 | 9.951 , 23.836 |
| Diabetic foot  Yes  No | 6(9.1)  117(14.4) | 60(90.9)  698(85.6) | 1.409 | 0.235 | 0.597 | 0.252 , 1.412 |
| Amputation  Yes  No | 2(5.9)  121(14.3) | 32(94.1)  726(85.7) | 1.922 | 0.166 | 0.375 | 0.089 , 1.585 |