

Table.1 Demographic data of study populations

| Variable | Summary statistics |
|--------------------------------------|---------------------------|
| Age/year | |
| Mean ± SD | 44.13±9.78 |
| Median (range) | 45 (18-59) |
| Gender | |
| Males | 63 (63.00%) |
| Females | 37 (37.00%) |
| Hypertension | |
| No | 67 (67.00%) |
| Yes | 33 (33.00%) |
| DM | |
| No | 69 (69%) |
| Yes | 31 (31.00%) |
| Treatment | |
| No | 69 (69.00%) |
| Oral hypoglycemic | 13 (13.00%) |
| Insulin | 18 (18.00%) |
| IHD | |
| No | 97 (97%) |
| Yes | 3 (3.00%) |
| Stages of CKD | |
| 1 | 10 (10.00%) |
| 2 | 10 (10.00%) |
| 3 | 10 (10.00%) |
| 4 | 10 (10.00%) |
| 5 | 60 (60.00%) |
| Dialysis duration if stage=5D | |
| Mean ± SD | 6.58±3.09 |
| Median (range) | 5 (2 – 16) |
| Bone density | |
| Normal | 55 (55.00%) |
| Osteopenia | 29 (29.00%) |
| Osteoporosis | 13 (13.00%) |
| Osteomalacia | 3 (3.00%) |

Table.2 Biochemical profile of all study population

| Variable | Summary statistics |
|---|---|
| Parathyroid hormone (PTH) Mean \pm SD Median (range) | 481.92\pm608.05 202.2 (12.7-1900) |
| Total calcium Mean \pm SD Median (range) | 8.69\pm1.30 8.4 (6.6-12.5) |
| Ionized calcium Mean \pm SD Median (range) | 1.04\pm0.21 1.00 (0.7-1.85) |
| Po4 Mean \pm SD Median (range) | 5.47\pm1.62 5.45 (2.8-10.9) |
| Triglyceride Mean \pm SD Median (range) | 149.25\pm85.57 121.5 (46-514) |
| Cholesterol Mean \pm SD Median (range) | 151.79\pm36.85 142.5 (80-295) |
| LDL Mean \pm SD Median (range) | 74.39\pm23.14 70 (34-155) |
| HDL Mean \pm SD Median (range) | 47.31\pm12.62 44.5 (21-89) |
| VLDL Mean \pm SD Median (range) | 28.98\pm15.85 24 (9-103) |

Table.3 Echocardiographic findings of all study population

| Variable | Summary statistics |
|---------------------------------|---------------------------|
| LVH | |
| No | 49 (49.00%) |
| Yes | 51 (51.00%) |
| EF | |
| Mean ± SD | 59.92±6.93 |
| Median (range) | 60 (41-76) |
| E/A ratio | |
| No diastolic dysfunction | 47 (47.00%) |
| Diastolic dysfunction | 53 (53.00%) |
| Rt. Side | |
| Normal | 95 (95.00%) |
| Dilated | 5 (5.00%) |
| IVS | |
| Mean ±SD | 1.69 ± 0.46 |
| Median (range) | 1.7 (1.00-2.80) |
| LVEDd | |
| Mean ± SD | 4.90±0.97 |
| Median (range) | 4.8 (2.75-6.93) |
| LA diameter | |
| Normal | 81 (81.00%) |
| Dilated | 19 (19.00%) |
| M valve | |
| Normal | 64 (64.00%) |
| Mild regurge | 32 (32.00%) |
| Rheumatic | 4 (4.00%) |
| T valve | |
| Normal | 75 (75.00%) |
| Mild regurge | 23 (23.00%) |
| Rheumatic | 2 (2.00%) |
| A valve | |
| Normal | 91 (91.00%) |
| Mild regurge | 4 (4.00%) |
| Rheumatic | 5 (5.00%) |

Table.4 Echocardiographic findings of all study population, continued

| Variable | Summary statistics |
|----------------------------|--------------------|
| PHTN | |
| No | 93 (93.00%) |
| Yes | 7 (93.00%) |
| Valve calcification | |
| No | 95 (95.00%) |
| Yes | 5 (5.00%) |
| Pericardial disease | |
| No | 86 (86.00%) |
| Yes | 14 (14.00%) |
| Regular wall motion | |
| Normal | 83 (83.00%) |
| Hypokinesia | 17 (17.00%) |
| RHD | |
| No | 94 (94.00%) |
| Yes | 6 (6.00%) |

Table.5 Prevalence of hyperparathyroidism of all study population

| Variable | Summary statistics |
|----------------------------|--------------------|
| Hyperparathyroidism | |
| No | 34 (34.00%) |
| Yes | 66 (66.00%) |

Table 5 and Figure 1 show that the prevalence of hyperparathyroidism was (66.00%) in the study.

Table.6 Relation between CKD stage and bone density of study populations

| Variable | Stage (1-2) | Stage (3-4) | Stage (5) | P | P1 | P2 | P3 |
|---------------------|----------------|----------------|----------------------------|------|------|------|------|
| Bone density | | | | | | | |
| Normal | 13 (65.00%) | 12 (60.00%) | 30 (50.00%) 19 (31.67%) | 0.73 | 0.49 | 0.47 | 0.78 |
| Osteopenia | 6 (30.00%) | 4 (20.00%) | 9 (15.00%) 2 (3.33%) | | | | |
| Osteoporosis | 1 (5.00%) | 3 (15.00%) | | | | | |
| Osteomalacia | 0 | 1 (5.00%) | | | | | |

P compared the 3 groups, P1 compare stage (1-2) to stage (3-4), P2 compare stage (1-2) to stage (5), and P3 compare stage (3-4) to stage (5)

Table.7 Relation between CKD stage and biochemical profile of study populations

| Variable | Stage (1-2) | Stage (3-4) | Stage (5) | P | P1 | P2 | P3 |
|------------------------|--------------------|--------------------|-------------------|--------|-------|---------|--------|
| PTH | | | | | | | |
| Mean ± SD | 66.54±45.80 | 142.04±45.8 | 733.7±673.1 | 0.0001 | 0.10 | 0.0001 | 0.0001 |
| Median (range) | 56.55 (12.7-210.8) | 91.45 (20.4-393.9) | 438.9 (27.3-1900) | | | | |
| Total calcium | | | | | | | |
| Mean ± SD | 9.44±1.02 | 8.32±0.98 | 8.57±1.39 | 0.01 | 0.02 | 0.02 | 1.00 |
| Median (range) | 9.5 (7.9-11.8) | 8.05 (6.8-10.2) | 8.1 (6.6-12.5) | | | | |
| Ionized calcium | | | | | | | |
| Mean ± SD | 1.16±0.15 | 0.98±0.17 | 1.02±0.22 | 0.001 | 0.001 | 0.0009 | 0.63 |
| Median (range) | 1.2 (0.9-1.5) | 0.91 (0.8-1.82) | 1.0 (0.7-1.85) | | | | |
| Po4 | | | | | | | |
| Mean ± SD | 4.16±1.00 | 5.49±1.15 | 5.91±1.68 | 0.0001 | 0.01 | <0.0001 | 0.85 |
| Median (range) | 4.1 (2.8-6.1) | 5.75 (3.1-7.8) | 5.9 (3.0-10.9) | | | | |
| Triglyceride | | | | | | | |
| Mean ± SD | 130.9±59.02 | 142.4±94.39 | 157.7±89.95 | 0.51 | 0.88 | 0.31 | 0.92 |
| Median (range) | 121 (60-274) | 117.5 (46-446) | 125.5 (51-514) | | | | |
| Cholesterol | | | | | | | |
| Mean ± SD | 159.5±50.34 | 147.5±31.37 | 150.7±33.43 | 0.87 | 0.92 | 0.92 | 0.52 |
| Median (range) | 144.5 (95-270) | 138 (117-247) | 145 (80-295) | | | | |
| LDL | | | | | | | |
| Mean ± SD | 74.1±20.68 | 68.85±20.58 | 76.85±24.70 | 0.45 | 0.42 | 0.65 | 0.22 |
| Median (range) | 63.5 (50-110) | 63 (40-117) | 70 (34-155) | | | | |
| HDL | | | | | | | |
| Mean ± SD | 53.2±17.77 | 46.7±11.73 | 45.5±10.30 | 0.06 | 0.30 | 0.06 | 1.00 |
| Median (range) | 47 (34-89) | 42.5 (32-66) | 44 (21-71) | | | | |
| VLDL | | | | | | | |
| Mean ± SD | 25.7±11.80 | 28.45±18.81 | 30.25±16.04 | 0.53 | 0.97 | 0.30 | 0.46 |
| Median (range) | 23.5 (12-55) | 23.5 (9-89) | 24 (12-103) | | | | |

P compared the 3 groups, P1 compare stage (1-2) to stage (3-4), P2 compare stage (1-2) to stage (5), and P3 compare stage (3-4) to stage (5)

Table.8 Relation between CKD stage and ECG findings of study populations

| Variable | Stage (1-2) | Stage (3-4) | Stage (5) | P | P1 | P2 | P3 |
|--------------------------|-------------|-------------|-------------|-------|------|-------|------|
| LVH | | | | | | | |
| No | 19 (95.00%) | 12 (60.00%) | 35 (58.33%) | 0.009 | 0.02 | 0.002 | 1.00 |
| Yes | 1 (5.00%) | 8 (40.00%) | 25 (41.67%) | | | | |
| RVH | | | | | | | |
| No | 18 (90.00%) | 20 (100%) | 58 (96.67%) | 0.25 | 0.45 | 0.26 | 1.00 |
| Yes | 2 (10.00%) | 0 | 2 (3.33) | | | | |
| P wave morphology | | | | | | | |
| Normal | 20 (100%) | 20 (100%) | 53 (88.33%) | 0.08 | 1.0 | 0.18 | 0.18 |
| P mitral | 0 | 0 | 7 (11.67%) | | | | |
| Ischemia | | | | | | | |
| No | 16 (80.00%) | 19 (95.00%) | 48 (80.00%) | 0.27 | 0.34 | 1.00 | 0.17 |
| Yes | 4 (20.00%) | 1 (5.00%) | 12 (20.00%) | | | | |
| Rate | | | | | | | |
| Normal | 19 (95.00%) | 17 (75.00%) | 56 (93.33%) | 0.42 | 0.61 | 1.00 | 0.36 |
| Sinus tachycardia | 1 (5.00%) | 3 (15.00%) | 4 (6.67%) | | | | |
| Arrhythmia | | | | | | | |
| Normal | 17 (85.00%) | 20 (100%) | 54 (90.00%) | 0.08 | 0.23 | 0.10 | 0.75 |
| AF | 3 (15.00%) | 0 | 2 (3.33%) | | | | |
| PVC | 1 (5.00%) | 0 | 4 (6.67%) | | | | |

P compared the 3 groups, P1 compare stage (1-2) to stage (3-4), P2 compare stage (1-2) to stage (5), and P3 compare stage (3-4) to stage (5)

Table.9 Relation between CKD stage and echocardiographic findings of study populations

| Variable | Stage (1-2) | Stage (3-4) | Stage (5) | P | P1 | P2 | P3 |
|--------------------------|-----------------|-----------------|------------------|---------|-------|---------|------|
| LVH | | | | | | | |
| No | 17 (85.0%) | 12 (60.0%) | 20 (33.33%) | <0.0001 | 0.08 | <0.0001 | 0.04 |
| Yes | 3 (15.0%) | 8 (40.0%) | 40 (66.67%) | | | | |
| EF | | | | | | | |
| Mean \pm SD | 63.6 \pm 4.04 | 60 \pm 6.31 | 58.71 \pm 7.54 | 0.03 | 0.32 | 0.02 | 1.00 |
| Median (range) | 63.5 (53-70) | 57.5 (52-74) | 57.5 (41-76) | | | | |
| E/A ratio | | | | | | | |
| No diastolic dysfunction | 19 (95.0%) | 11 (55.0%) | 17 (28.33%) | <0.0001 | 0.003 | <0.0001 | 0.03 |
| Diastolic dysfunction | 5 (5.0%) | 9 (45.0%) | 43 (71.67%) | | | | |
| Rt. Side | | | | | | | |
| Normal | 19 (95.00) | 19 (95.0%) | 57 (95.0%) | 1.00 | 1.00 | 1.00 | 1.00 |
| Dilated | 1 (5.00%) | 1 (5.00%) | 3 (5.0%) | | | | |
| IVS | | | | | | | |
| Mean \pm SD | 1.56 \pm 0.56 | 1.68 \pm 0.54 | 1.73 \pm 0.39 | 0.21 | 0.56 | 0.06 | 0.71 |
| Median (range) | 1.4 (1.09-2.8) | 1.7 (1.0-2.5) | 1.8 (1.0-2.4) | | | | |
| LVEDd | | | | | | | |
| Mean \pm SD | 4.49 \pm 0.86 | 4.61 \pm 0.80 | 5.13 \pm 0.99 | 0.01 | 1.00 | 0.02 | 0.10 |
| Median (range) | 4.47 (3.02-6.1) | 4.7 (3.02-5.88) | 5.2 (2.75-6.93) | | | | |
| LA diameter | | | | | | | |
| Normal | 18 (80.0%) | 17 (85.0%) | 46 (76.67%) | 0.37 | 1.00 | 0.33 | 0.54 |
| Dilated | 2 (10.00%) | 3 (15.00%) | 14 (23.33%) | | | | |
| M valve | | | | | | | |
| Normal | 16 (80.0%) | 15 (75.0%) | 33 (55.0%) | 0.046 | 0.19 | 0.03 | 0.45 |
| Mild regurge | 2 (10.0%) | 5 (25.0%) | 25 (41.67%) | | | | |
| Rheumatic | 2 (10.0%) | 0 | 2 (3.33%) | | | | |
| T valve | | | | | | | |
| Normal | 20 (100%) | 19 (95.0%) | 36 (60.00%) | 0.001 | 0.31 | 0.003 | 0.01 |
| Mild regurge | 0 | 1 (5.0%) | 22 (36.67%) | | | | |
| Rheumatic | 0 | 0 | 2 (3.33%) | | | | |
| A valve | | | | | | | |
| Normal | 17 (85.0%) | 20 (100%) | 54 (90.0%) | 0.51 | 0.20 | 0.73 | 0.34 |
| Mild regurge | 1 (5.0%) | 0 | 3 (5.00%) | | | | |
| Rheumatic | 2 (10.0%) | 0 | 3 (5.00%) | | | | |

P compared the 3 groups, P1 compare stage (1-2) to stage (3-4), P2 compare stage (1-2) to stage (5), and P3 compare stage (3-4) to stage (5)

Table.10 Relation between CKD stage and echocardiographic findings of study populations, continued

| Variable | Stage (1-2) | Stage (3-4) | Stage (5) | P | P1 | P2 | P3 |
|----------------------------|----------------------|--------------------------|----------------------------|-------|------|-------|-------|
| PHTN | | | | | | | |
| No | 20 (100%) | 19 | 54 | 0.29 | 1.00 | 0.33 | 0.67 |
| Yes | 0 | (95.0%) 1 (5.0%) | (90.00%) 6 (10.33%) | | | | |
| Valve calcification | | | | | | | |
| No | 20 (100%) | 20 (100%) | 55 | 0.17 | 1.0 | 0.32 | 0.32 |
| Yes | 0 | 0 | (91.67%) 5 (8.33%) | | | | |
| Pericardial disease | | | | | | | |
| No | 19 | 17 | 50 | 0.42 | 0.61 | 0.28 | 1.00 |
| Yes | (95.0%) 1 (5.00%) | (85.0%) 3 (15.00%) | (83.33%) 10 (16.67%) | | | | |
| Regular wall motion | | | | | | | |
| Normal | 20 (100%) | 20 (100%) | 43 | 0.001 | 1.00 | 0.005 | 0.005 |
| Hypokinesia | 0 | 0 | (71.67%) 17 (28.33%) | | | | |
| RHD | | | | | | | |
| No | 18 | 20 (100%) | 56 | 0.39 | 0.49 | 0.64 | 0.57 |
| Yes | (90.0%) 2 (10.0%) | 0 | (93.33%) 4 (6.67%) | | | | |

P compared the 3 groups, P1 compare stage (1-2) to stage (3-4), P2 compare stage (1-2) to stage (5D), and P3 compare stage (3-4) to stage (5)