Material & Methods
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The present study was planned and conducted in the Department of Medicine, Pt. J.N.M. Medical College and Hospital, Raipur (C.G.). For the purpose of the study the elderly subjects were selected as per the methodology outlined below. These subjects were then clinically examined and investigated as per the terms of the study to produce the data, which was then categorized, tabulated and classified, and put to analysis.

Material: This study included 1000 elderly persons, of both sexes.

Criteria for selection of persons:

1. The age of the persons should be 60 years and above.
2. All elderly persons, residing in the locality visited, will be included in the study.
3. Out of 1000 persons, 500 will be residing in rural areas.
4. Rest 500 persons, will be included from urban areas.
5. Both males and females of 60 years of age and above will be included in the study.
6. All elderly persons residing in the locality, irrespective of their status of health, will be included in the study (both healthy and others).

The determination of age was made on the following basis:

1. As given by the patient, matching to his physique (e.g. graying of hair, arcus senilis, cataract wrinkling of skin, etc.
2. In case of doubt, the help of following was taken:
   (a) Documentary proof such as ration card, kotwal register, voter identity card or any school certificate in case of educated persons etc.
   (b) Determination of age on basis of family tree.
   (c) In case of females, history of menopause.

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(d) Determination of age in relation to any famous incidence.

(e) Age of marriage and age of first child.

Population and area wise distribution of Raipur town and surrounding villages were studied. Certain areas were chosen in rural and urban parts of Raipur district.

Rural: In rural parts, the following areas were visited.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Area</th>
<th>No. of persons studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>Mathpara</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>Tiraiyya</td>
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</tr>
<tr>
<td>4</td>
<td>Parastarai</td>
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<td>5</td>
<td>Charoda</td>
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<td>6</td>
<td>Kapsada</td>
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<td>7</td>
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<td>Sondongri</td>
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<td>Khamtarai</td>
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<td>13</td>
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</tr>
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<td>15</td>
<td>Mana</td>
<td>54</td>
</tr>
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<td>16</td>
<td>Miscellaneous</td>
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<td>Total</td>
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Urban: In urban parts, the following areas were visited.

Table 2

<table>
<thead>
<tr>
<th>S.No.</th>
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<td>Santoshi nagar</td>
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<td>Raja Talab</td>
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<td>Fafadih</td>
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</tr>
<tr>
<td>Total</td>
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</tr>
</tbody>
</table>

METHODS:

After selection of the patients, the study was performed by the following methods:

Method I:

1. Local health workers, such as Anganwadi workers, health assistants and paramedical staffs residing in a particular village were contacted in rural areas. In urban areas, local voluntary organizations or clubs were contacted prior to the visit in their respective localities.

2. In rural areas, all the elderly persons were informed on the previous day of study, by the local health workers along with the Kotwal. The elderly
persons were instructed to remain in empty stomach on next morning. Similar procedure was carried out in urban areas.

(3) On the day of study, a team of doctors and paramedical staff reached the locality in morning and approached all the elderly persons residing in that locality.

(4) A door to door approach was made on first 2 days. It was decided to conduct the study at any common place in the locality such as Panchayat Bhavan, Primary Schools, Community centers, local health centers and subcenters where all the elderly persons of that locality gathered.

(5) Detailed history and physical examination were carried out as per proforma.

(6) ECG recording which was done using PHILIPS 100 page writer machine, which recorded the twelve leads and a long rhythm strip at a time. ECG was taken by a single observer.

(7) Additional investigations of Hb, blood sugar, urea, serum creatinine and cholesterol was done.

All the patients included in the study were subjected to detailed history taking, thorough clinical examination and investigation.

(A) Presenting complaints with a detailed history of these complaints was taken.

(B) Past history regarding diabetes mellitus, HTN, previous history of angina, MI, PTB, seizures, paralytic attack was taken.

(C) Personal history: due stress was put on

  (1) Age/sex

  (2) Diet: High cholesterol, animal fats and light sodium diet, cooking habits.

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(3) Smoking: Duration and type of smoking (tobacco, cigarette, bidi)

(4) Alcohol: Duration, quantity

(5) Physical inactivity: Sedentary life style.

(6) Psychological conditions: depression, absence of social support, mental stress.

(D) Occupational history: regarding previous and present occupation.

Physical examination:

A thorough physical examination of each patient was carried out and due stress was given on following points:

- Pulse rate, rhythm, volume, character, synchronicity, and condition of vessel wall.

- Blood pressure: Patient was taken as hypertensive if BP>140/90 mmHg.

- Pallor, cyanosis JVP and pedal oedema.

- Weight and height of the patient was recorded in kilograms and feet respectively.

Systemic examination:

- **Cardiovascular system**: Heart sounds whether distinct or muffled, presence of S3, S4, murmur over mitral area which is indicative of papillary muscle dysfunction or valvular heart disease, pericardial rub.

- **Respiratory system**: The rate of respiration and presence of crepts or rhonchi was looked for.

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• **P/A examination:** Presence of any organomegaly free fluid, hernia, hydrocele (in men), uterine prolapse (in women) was noted.

• **CNS:** Any neurological deficit and abnormalities in speech was noted.

**Investigations:**

• Hb  
• Blood sugar - fasting  
• Blood urea  
• S. creatinine  
• S. cholesterol  
• ECG

**Study plan:**

Reading of ECG was done under the following headings:

• Rate  
• Rhythm  
• Axis  
• P wave  
• PR interval  
• QRS  
• QT interval  
• R wave progression (in chest leads)  
• Q wave  
• ST segment  
• T wave  
• U wave

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Rate: The interval in seconds between two successful R waves divided by 60 (sec.) gave the heart rate per minute, if the ventricular rhythm was regular. If the ventricular rhythm was irregular, the number of R waves in a given period of time (6 sec.) was counted and the results converted into number of R waves per minute. The normal rate was considered to be between 60-100/min (Schamroth Leo, 1990).

Rhythm: If the successive R-R intervals were equal the rhythm was considered as regular, otherwise it will be considered as irregular (Schamroth Leo, 1990).

P wave: It is the deflection produced by atrial depolarization. 1st positive wave before QRS. Its duration is normally less than 0.12 seconds and amplitude is less than 0.25mV in all leads (Goldschlager Nora, Goldman MJ, 1989).

Axis: The general, mean or dominant direction of all cardiac vectors is the mean vector and is expressed electrocardiographically as the mean QRS axis. The direction of the mean QRS axis on the frontal plane is known as the mean manifest frontal plane QRS axis and is determined from the frontal plane leads I, II, III, aVR, aVL, aVF. The frontal plane axis is normally directed between -30° and +90°. A three step method was used to determine the frontal plane axis.

- The transitional lead was identified, as defined by equal amplitudes was positive and negative components of the QRS complex.
- The lead perpendicular to the transitional lead was identified using the hexaxial reference system.
- The prominent direction of the QRS complex in the lead identified in step II was considered. If the direction was positive the axis was equal to the positive pole of that lead and vice versa (Schamroth Leo, 1990).

PR interval: It is the interval between the onset of the P wave and the onset of the QRS complex. The normal PR interval is in the range of 0-12 sec to 0-20 sec (Goldschlager Nora, Goldman MJ, 1989).

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QRS: It is measured from the onset of Q wave (or R wave if no Q wave is visible) to the termination of S wave (or r' or s' wave if no S wave is visible). The upper limit of normal is 0.1 sec in the frontal leads and 0.11 sec in precordial leads (Wagner Galen S, 1998).

QT interval: It is measured from the onset of the Q wave to the end of the T wave and represents the duration of electrical systole. The QT interval varies with the heart rate and autonomic nervous system input. The QT interval may be corrected for heart rate (QTc). The normal QTc usually does not exceed 0.42 sec in men and 0.43sec in women. Formula for calculating QTc was given by Bazett and modified by Hodges and coworkers and Macfarlane and Veiten Lawrie. It is QTc= QT+1.75 (ventricular rate -60) (Goldschlager Nora, Goldman MJ, 1989).

Q wave: It was the initial negative deflection resulting from ventricular depolarization. The upper limit of normal range of Q wave is less than 0.03 seconds in all leads except V1 to V3 in which any Q wave was considered abnormal (Goldschlager Nora, Goldman MJ, 1989).

R wave: It was the first positive wave appearing in the QRS complex it may appear at the onset of the QRS complex or following a Q wave (Schamroth Leo, 1990).

ST segment: It is that portion of the tracing from the end of QRS complex to the onset of the T wave. This segment is usually isoelectric but may vary from 0.5 to 2 mm in the precordial leads (Wagner Galen S, 1998).

T wave: It is the final major wave depicted on the ECG during a cardiac cycle. It represents ventricular recovery. Its amplitude doesn't normally exceed 5mm in any limb lead or 10mm in any precordial lead (Schamroth Leo, 1990).

U wave: It is the deflection (usually positive) seen following the T wave and preceding the next P wave. The cause of this wave is thought to be repolarization of the intraventricular (Purkinje) conduction system. It is

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approximately 10% of the T wave amplitude (Gold Schlager Nora, Goldman Mervin J 1989).

The recorded electrocardiograms were interpreted and analysed on the following basis.

The recorded electrocardiograms were interpreted and analysed as normal or abnormal. The abnormality when present was again classified according to the various patterns observed.

(1) Normal ECG

(2) Major Q or QS pattern: Suggestive of existence of ischemic heart disease.

(3) ST changes: which might be associated with hypertension, cardiomyopathy or valvular especially aortic heart disease.

(4) Abnormal axis deviation: right or left and ventricular hypertrophy - right or left.

(5) Conduction defects: atrioventricular or bundle branch block (right, left or incomplete right).

(6) Rhythm defects: sinus, junctional or ventricular.

For the purpose of the study, a Q wave existed when its duration was more than 0.04sec and amplitude more than 25% of that of the R wave. The elevation of ST segment more than two small squares, or a polarity of T wave opposite to that of the QRS complex in the lead were regarded abnormal. A mainly positive deflection in the lead I and negative deflection in leads II and III were regarded as left axis deviation, and a mainly negative deflection in lead I and positive deflection in leads II and III as right axis deviation in limb leads. LVH was indicated by SV1 or SV2 more than 20mm and RV5 or RV6 more than 26mm, a

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left axis deviation or intrinsicoid deflection in V5 or V6 ≥0.05sec; and RVH existed when RV1 exceeded SV1 in amplitude along with a right axis deviation.

Conduction defects consisted of AV dissociation (when P waves and QRS complexes were independent of each other), and bundle branch blocks with wide QRS complexes in all leads (slurred R waves in V5-V6 = LBBB; slurred S waves in V5-V6 = RBBB).

The rhythm defects included sinus bradycardia, sinus tachycardia, sinus arrhythmia, tachycardia (supraventricular or ventricular), atrial fibrillation and flutter and ectopies (supraventricular and ventricular).

The details of this interpretation are described in review of literature.

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