Calcium Creatinine Ratio and Microalbuminuria as A Screening Test for Pre Eclampsia

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ABSTRACT
Pre eclampsia is a hypertensive disorder of pregnancy characterized by hypertension and excess protein excretion in the urine. It complicates 5-10 %of all pregnancies. Being a major cause for maternal and fetal morbidity and mortality, screening test for pre-eclampsia is essential to prevent complications. This study provides an effective screening test thereby an idea to implement measures of prevention. This is a prospective study, including 200 asymptomatic pregnant women of 20-24 weeks gestational age, having regular antenatal visits in GOVT RSRM LYING IN HOSPITAL, in the year 2015-2016. Urine samples are tested for microalbuminuria, calcium and creatinine using commercially available kits. Among those, who test positive for urine calcium creatinine ratio 82.6% and those who test positive for urine microalbumin. 38.1% developed pre-eclampsia occurs after 20 weeks of gestation. Incidence is markedly influenced by race, ethnicity, environmental, socioeconomic and seasonal events. Incidence in nulliparous ranges from 3-10%. Eclampsia. Spot urine estimation of calcium creatine ratio less than 0.04 is found to be a good test for predicting pre-eclampsia.

KEYWORDS

INTRODUCTION:
Hypertensive disorders during pregnancy are the commonest medical disorders during pregnancy and continue to be the most important cause of maternal and perinatal mortality and morbidity worldwide. Hypertensive disorders complicate 5-10% of all pregnancies with hypertension.

To reduce the impact of pre-eclampsia on maternal mortality, it is necessary to establish correct diagnosis of preeclampsia and to proceed with early interventions to prevent complications.

AIM:
To determine the predictive values of decreasing urinary calcium to creatinine ratio and microalbuminuria for preeclampsia, in a spot urine sample, in asymptomatic pregnant women between 20-24 weeks of gestation in order to recommend it as screening test for preeclampsia.

METHODS:
Study Design: PROSPECTIVE Study Sample: 200 asymptomatic pregnant women Study Place: GOVT RSRM LYING IN HOSPITAL Study Period: 2015-2016

METHODOLOGY:
- Patients were counseled, given proforma and written informed consent obtained
- Detailed history obtained
- Blood pressure recorded in sitting position in right arm
- Urine samples for microalbumin, calcium and creatinine using commercially available kits.
- O Cresolphalein complex reaction was used to estimate calcium. Jaffes method was used to estimate creatinine.
- Microalbumin was detected by immunometric assay.
- Pre eclampsia was defined as systolic arterial blood pressure of more than or equal to 140/90 mmHg and or diastolic blood pressure of more than or equal to 90mmHg.
- Calcium creatinine ratio less than or equal to 0.04 were considered test positive and those with ratio of more than 0.04 were considered negative.
- Urine microalbumin levels between 30 to 300 mg/l were considered test positive, and those with levels <30 mg/l were considered test negative.
- Predictive values of calcium to creatinine at less than or equal to 0.04 and microalbuminuria determined by statistical analysis

STATISTICAL METHODS:
TEST USED: CHI SQUARE AND FISHER
P value:
<or equal to 0.01-strongly significant
0.01-0.05-moderately significant
0.05-0.1-significant

ESTIMATION OF URINARY CALCIUM:
- ORTHO CRESOLPTHALEIN COMPLEX REACTION
- Measurement of calcium is done in coloured complex at wavelength of 570nm-580nm.

ESTIMATION OF URINARY CREATININE:
- JAFFE’S METHOD
- The intensity of the coloured orange red complex formed by creatinine in an alkaline picrate solution is estimated.

ESTIMATION OF URINE MICROALBUMIN:
- IMMUNOMETRIC ASSAY
- Microalbumin in urine is measured by turbidometricimmunoassay. It is based on agglutination reaction. The turbidity produced by albumin is measured at a wavelength of 340nm.

RESULTS:
URINE CALCIUM-CREATININE RATIO (UCCR) AND DEVELOPMENT OF PRE ECLAMPSIA

<table>
<thead>
<tr>
<th>UCCR</th>
<th>DEVELOPED PREECLAMP-SIA</th>
<th>NORMOTENSIVE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST POSITIVE</td>
<td>19(9.5%)</td>
<td>4(2%)</td>
<td>23(11.5%)</td>
</tr>
<tr>
<td>TEST NEGATIVE</td>
<td>7(3.5%)</td>
<td>170(85%)</td>
<td>177(88.5%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26(13%)</td>
<td>174(87%)</td>
<td>200(100%)</td>
</tr>
</tbody>
</table>
In this study of asymptomatic pregnant women between 20-24 weeks gestation, estimation of calcium—creatinine ratio less than or equal to 0.04 in a spot urine sample was found to be a GOOD test for predicting pre eclampsia.

Estimation of urinomicroalbumin in a spot sample was a FAIR test for predicting pre eclampsia.

**REFERENCES**

1. American College Of Obstetricians and Gynaecology (ACOG) Diagnosis and Management of Pre eclampsia and Eclampsia.