ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

CALCIUM CREATININE RATIO AND MICROALBUMINURIA AS A SCREENING TEST FOR PRE ECLAMPSIA

KEY WORDS:

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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 ratio82.6% and those who test positive for urine microalbumin,38.1%developed pre Onset of 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-eclpamsia.

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INTRODUCTION :

Hypertensive disorders during pregnancy are the commonest medical disorders during pregnancy and continue to be themost 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 preeclampsiain 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 Cresolpthalein complex reaction was used to estimate calciumJaffes 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 wavele ngth 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-CREATINIE RATIO (UCCR) AND DEVELOPMENT OF PRE ECLAMPSIA

TABLE 1

UCCR	DEVELOPED PREECLAMPSIA	NORMOTENSIVE	TOTAL
TEST +ve	19(9.5%)	4(2%)	23(11.5%)
TEST –ve	7(3.5%)	170(85%)	177(88.5%)
TOTAL	26(13%)	174(87%)	200(100%)

URINE MICRO ALBUMIN AND DEVELOPMENT OF PRE ECLAMPSIA

TABLE 2

URINE MICROALBUMIN	DEVELOPED PRE ECLAMPSIA	NORMOTENSIVE	TOTAL
POSITIVE	16(8%)	26(13%)	42(21%)
NEGATIVE	10(5%)	148(74%)	158(79%)
TOTAL	26(13%)	174(87%)	200(100%)

ASSOCIATION OF URINE CALCIUM –CREATINIE RATIO AND PRE ECLAMPSIA

TABLE 3

UCCR<0.04	DEVELOPED PREECLAMPSIA	NORMOTENSIVE
POSITIVE(23)	19(9.5%)	4(2%)
NEGATIVE(177)	7(3.5%)	170(85%)
TOTAL	26(13%)	174(87%)

ASSOCIATION OF MICROALBUMINURIA AND PRE ECLAMPSIA

TABLE 4

URINE MICROALBUMIN	DEVELOPEDPREECLAMPSIA	NORMOTENSIVE
POSITIVE(42)	16(8%)	26(13%)
NEGATIVE	10(5%)	138(74%)

SUMMARY:

- In this study ,majority 65.5% were in age group of 21to 30 years,26% were in the age group of below 20years,8.5% were in the agegroup of above 30 years of age.
- Preeclampsia developed in 46.2% of study group whowere in the age group of 21 30 years, 34.6% who werebelow the age group of 20 years and 19.2% who wereabove 30 years of age.
- 65.4% ofprimigravidae developed preeclampsia and 34.6% of multigravidae developed preeclampsia.
- Among the women who test positive for urinecalciumcreatinine
- ratio,82.6% developed pre eclampsia.
- Among thosewith test positive for urinemicroalbumin,38.1% developed preeclampsia.
- Predictive value of urine calcium creatinine ratio using area under curve of ROC showed UCCR at less than or equal to 0.04 was a good test.

TABLE 5

STATISTICS	UCCR<0.04	UrineMicroalbumin 30-300mg
P value <0.001 <0.001		
Sensitivity	73.1%	61.5%
Specificity	97.7%	85%
Positive PredictiveValue	82.6%	38.1%
Negative PredictiveValue	96%	93.7%
Statistical Accuracy	94.5%	82%

CONCLUSION:

Screening test for preeclampsia is very essential to prevent complications . In this study of aymptomatic pregnant women between 20-24weeks gestation estimation of calcium –creatinieratioat 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 urinemicroalbumin in a spot sample was a FAIR test for predicting pre eclampsia.

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