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RESEARCH ARTICLE

TO FIND ROLE OF URIC ACID IN PREECLAMPSIA WOMENIN TERM PREGNANCY

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ABSTRACT

Conversational agents emulate human communication in order to provide a more natural user interface to applications or simply to begin a dialog with a user. Prior studies of this software have focused upon individual systems, but few have provided comparisons of their capabilities. Here, we evaluate three such programs (Tutor Mike, Cleverbot, and Jabberwacky). Results show that there was a significant difference among the three chatbots in terms of perceived friendliness and knowledge about the topic under discussion, but users did not believe the systems were very humanlike and probably would not use them again.

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INTRODUCTION

Pre-eclampsia is the most common cause of maternal death and it complicates ~6-8 of pregnancy. It is also associated with perinatal mortality and morbidity. Mechanism of preeclampsia is uncertain. However it is proposed that endothelial dysfunction is mainly associated with pathophysiology of preeclampsia lead to increased risk of morbidity and mortality in mother and child. The correlation between endothelial dysfunction and inflammation, oxidative stress and the hypercoagulable state is complex. in the disease of preeclampsia, all these factors augment effect of each other which results to an increased vascular damage. Pre-eclampsia involves multiple systems in pregnant women and diagnosed by the development of proteinuria and hypertension, impaired liver function and raised serum uric acid after 20 weeks of gestation. It is proposed that increased serum uric acid is related with hypertension, renal disease and adverse cardiovascular events in the non-pregnantwomen and endothelial dysfunction, inflammation and unfavorable fetal outcomes in pregnant women. Endothelial dysfunction may lead to breakdown of trophoblast, cytokine release and ischemia, results a raised level of uric acid. In early pregnancy, serum uric acid fall to <3mg/dl due toincrease in renal blood flow. In later pregnancy during the third trimester, reaching levels of 4 to 5 mg/dl by term. Uric acid is mediator of inflammation thus enhanced superoxide generation. Hyper uricemia in preeclamptic women is not only a indicator of disease severity but it also have a direct role with the pathogenesis of the disease as uric acid unfavorably effect both placenta and maternal vasculature. Hyper uricemia may lead hypertension proliferation of vascular smooth muscleandproteinuria. serum uric acid level during pregnancy can be used as a biomarker for Preeclampsia and increased level of serum uric acid levels can be associated with the severity of Preeclampsia. Present study was designed to find out role of serum uric as an early predictor of preeclampsia.

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MATERIALS AND METHODS

A case control study was conducted on 30 pre- eclampltic women and 20 age matched women with normal pregnancy. Patients were taken from Department of Obstetrics and Gynecology, C. U. Shah Medical College and Hospital Surendranagar, from January 2018 to December 2018. Letter of consent was taken from each subject. Pre-eclampsia was diagnosed by pregnancy with gestational age >20 weeks, with blood pressure ≥140/ ≥90 mm Hg noted on two times 6 hours apart and 24-hour urinary protein ≥300mgor ≥1 on dipstick urinalysis in two samples taken ≥6hr apart. Pregnant women with pre-existing hypertension, renal disease, cardiovascular disease, diabetes mellitus or any endocrinopathies were excluded from the study. Blood samples were collected for estimation of serum uric acid. Serum uric acid was measured by Autoanalyzer using standard kit. Variables were expressed as mean±SD. Comparison of parameters were carried out by student "t" test. $P<0.05$ was considered statistically significant. Sensitivity and Specificity, positive and negative predictive value of serum uric acid as a biomarker of disease was calculated.

RESULTS

Age distribution is study subjects is tabulated as table It was observed that mean age of normal pregnancy group was 28.43±4.11 with mean gestational age was 30.90±3.9 weeks. Mean age of pre-eclampsia group was 29.07±5.54 with mean gestational age was 28.70±4.0 weeks. Comparison of level of serum uric acid in study groups is tabulated as table 2. Mean level of serum uric acid was increased in pre-eclampsia group as compared to level of serum uric acid of group of normal pregnant women and it showed a highly significant difference (P<0.001). Serum uric acid as a biomarker based on sensitivity, specificity, positive predictive value and negative predictive value was calculated (Table 3). It was observed that sensitivity was 65%, specificity was 95%, positive predictive value was 94%and negative predictive value of uric acid was60%.

Table 1. Age distribution in study subjects

No of cases in parenthesis	Values are expressed as mean± SD	
Variables	Normal pregnancy group (20)	Preeclampsia group (30)
Age (years)	28.43±4.11	29.07±5.54
Gestational age (weeks)	30.90±3.9	28.70±4.0

Table 2. Comparison of level of serum uric acid in study groups

	Mean level of Uric acid(mg/dl)	Standard Deviation
Normal pregnancy group	4.39	0.72
Pre-eclampsia group	7.29	1.24

P value <0.001

Table 3. Serum uric acid as a Biomarker

Sensitivity	65%
Specificity	95%

DISCUSSION

Pre-eclampsia is a pregnancy precise, multisystem syndrome differentiated by decreased organ perfusion resulting to vasospasm and coagulation cascade activation. This syndrome has been related to multiple factors. However, exact cause of preeclampsia is not known. Mean age of pre-eclampsia group was 29.07±5.54 with mean gestational age was 28.70±4.0 weeks. There is mild difference between the mean age and gestational weeks of normal pregnant women and of pre-eclamptic group. A study found that pre-eclampsia is reported in both younger and the middle aged women.

A study also stated that rate of pre-eclampsia was decreased in women with age <30 years and it increased in women with age 30-34 years In addition some studies found that maternal age found to be an independent risk factor for early development of preeclampsia and impaired growth offetus. Our study is in accord with a study who found that preeclampsia develops before 33 weeks of gestation increased the risk of adverse maternal and perinatal outcome. It is stated that early-onset of pre-eclampsia, with <34 gestational weeks, may be associated with placental pathology. However, gestational age ≥34 weeks may present late onset preeclampsia which may be triggered by intrinsic pathology involving overcrowding of microvillus.

It is suggested that oxidative stress proteins change the maternal response via regulating many growth factors and preventing early onset of preeclampsia. Mean level of serum uric acid was increased in pre-eclampsia group as compared to level of serum uric acid of group of normal pregnant women and it showed a highly significant difference (P<0.001). It is reported that in normal pregnant women the level of serum uric acid is 25-35% decreased of than the level of uric acid of non-pregnant women. However the level of uric acid increased and come to normal level. It is proposed that there is raised glomerular filtration in pregnant women and reduced reabsorption of uric acid from proximal tubules of kidney during pregnancy. In women with pre-eclampsia there is impaired trophoblastic invasion in the placenta and ischemic metabolite formation.

These ischemic metabolite are responsible for peripheral vasoconstriction in glomeruli and glomerular endotheliosis results in decreased GFR and increased uric acid net reabsorption from proximal convulated tubule leading to increased level of serum uric acid. A study found that raised uric acid reabsorption, increased sympathetic activity, repressed the activity of angiotensin system and decreased the level of estrogen. Some studied suggested that in pre-eclampsia increased level of serum lactate may reduced the secretion of uric acid through renal tubules. Though some studies show that uric acid may itself have a pathogenic role in Preeclampsia resulting in a vicious cycle of disease. However, the role of serum uric acid as a marker of preeclampsia is not confirmed. Serum uric acid as a biomarker based on sensitivity, specificity, positive predictive value and negative predictive value showed it has high positive predictive value and high specificity. Uric acid level >6 mg/dl in the third trimester showed that the chance of developing Preeclampsia is 94%. According to a study in preeclampsia high levels of uric acid, may be resulting from the body's effort to manage with oxidative stress.

Limitation: Levels of serum uric acid in women with first and second trimester of pregnancy were not estimated. It is therefore not clear that the level of serum uric acid was raised in acute phase of disease or it may slowly rise from the initial stage of pregnancy.

Conclusion

It is concluded that age may be an independent risk factor for developing preeclampsia. Serum uric acid level may be a biomarker of preeclampsia and also may help to monitor the disease.

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