Short Communication
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Prothrombin G20210A Mutation in Sudanese Women with Recurrent Pregnancy Loss

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Abstract
The association between the Prothrombin G20210A mutation and recurrent pregnancy loss is well documented in the literature among different populations. A descriptive study was conducted in Omdurman Maternity Hospital, Sudan, to find the prevalence of the Prothrombin G20210A mutation among Sudanese women with recurrent pregnancy loss. Analysis of the Prothrombin G20210A mutation was performed using PCR-RFLP for 67 enrolled women with recurrent pregnancy loss of two times or more. Data analysis was performed using SPSS. The prothrombin G20210A mutation was present in 4 (6%) out of the total 67 enrolled cases; 3 (4.5%) had the GA genotype (hetrozygous), while one had the (1.5%) AA genotype. The study revealed that the Prothrombin G20210A mutation is less prevalent among Sudanese women with recurrent pregnancy loss compared to other Arab nations. A large case-control study is needed.
Keywords: Pregnancy loss, prothrombin, G20210A, mutation

Introduction

Recurrent pregnancy loss remains a significant health problem among women with a rate of 5%.[1] In 50% of the cases the etiology is unknown.[2] Thrombophilia might increase its risk by adversely affecting the normal placental vascular function. Prothrombin G20210A mutation as a type of inherited thrombophilia varies and it's prevalence ranges from 0.7 to 6.7% on different ethnic groups.[3] The association between Prothrombin G20210A mutation and pregnancy adverse effects was controversial. However, some studies reject that association.[4-6] Based-on a numerous of systematic reviews and meta-analyses, association of the Prothrombin G20210A mutation with the risk of pregnancy complications is well recognized.[7,8] There are few published data on Prothrombin G20210A and recurrent pregnancy loss among Sudanese.[6] Thus, current study aimed to estimate the prevalence of the Prothrombin G20210A mutation among Sudanese women with recurrent pregnancy loss.

Methods

A descriptive study was carried-out in Omdurman Maternity Hospital-Sudan. Ethical approval of the study obtained from the Research Board at the Faculty of Medical Laboratory Sciences, University of Khartoum. After signing an informed consent, a consecutive women with history of recurrent pregnancy loss of two times or more were enrolled to the study. Demographic and clinical data was collected using a questionnaire. Three ml of venous whole blood was collected in EDTA for analysis of Prothrombin G20210A mutation using PCR-RFLP, DNA extraction via Instagene matrix (Chelex) protocol. Restriction fragment length polymorphism-PCR of Prothrombin gene was used where the region flanking the mutation was amplified by PCR and the PCR product digested with HindIII restriction enzyme. Digested products then were separated on a 3% agarose gel, stained with ethidium bromide dye and visualized on a UV trans-illuminator as described in the literature.

Results and Discussion

Sixty seven women with recurrent pregnancy loss were enrolled in this study, 62 (92.5%) with no family history. Twenty three (34.3%) had two times pregnancy loss, while 44 (65.7%) had more than two times pregnancy loss. Their ages mean and range was 33.6 (20–48) year. Prothrombin G20210A mutation was present in 4 (6%) out of the total 67 enrolled women; 3 (4.5%) had GA genotype (hetrozygous), while one had (1.5%) AA genotype. The 4 cases that had Prothrombin gene mutation were belonged to ages 25, 28, 29, and 41 years. Three cases had a history of three pregnancy loss, while one case with history of two pregnancy loss. It has more recently been shown that previous study found that 3% of Sudanese women with recurrent pregnancy loss had Prothrombin G20210A mutation, no mutant gene was detected in normal control group, and the result was not statistically significant.[6] Interestingly Prothrombin G20210A mutation rate is higher among women with recurrent pregnancy loss in Arabic countries. A study done by Gawish and Al-Khamees in Saudi Arabia found Prothrombin mutation ratio was high among cases with late pregnancy loss (50%) followed by early (38%) and controls (1.4%) that was statistically significant.[9] Another study carried out in Egypt by Ahmad et al.,[10] revealed that in comparison to controls, cases of unexplained pregnancy loss showed a significantly higher frequency of FII GA (34.7% versus 1.4%, OR = 36.7, $P < 0.0001$) genotype with significantly lower frequency of the normal genotype FII GG ($P < 0.0001$). The mutant allele FII A showed also a significantly higher frequency among cases compared to controls ($P < 0.0001$). However, There was no F2 G20210A mutation detected among Nigerian ($N = 389$) in the study done by Sarah, et al.,[11] in Nigeria. Our study

findings revealed that Prothrombin G20210A mutation is low prevalent among Sudanese women with recurrent pregnancy loss in comparison to others Arab nations. This could be because of Sudanese are a mix of Afro-Arab ethnic group. This is a small sample study and no controls group was included. Larger case-control study is needed.

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Conflict of Interest

The authors have no conflicts of interest.

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