ETHANOLIC EXTRACT OF PTEROCARPUS ERINACEUS BARK IMPAIRS PLATELET FUNCTIONS

By

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ABSTRACT

Objective: To investigate the effects of Pterocarpus erinaceus extract on platelets count and functions in rats.

Methods: 75 rats were fed with alcohol extracts of Pterocarpus erinaceus for two months. Platelets count, Prothrombin time, Bleeding and Clotting time were determined in the rats by method of Dacies and Lewis.

Result: Alcoholic extract of the bark of P. erinaceus prolongs bleeding time, clotting time and prothrombin time, but reduces platelet count.

Conclusion: It is recommended that ethanolic extract of the plant be used with caution in bleeding disorders.

KEY WORDS: Pterocarpus erinaceus; platelets, bleeding, rats, blood.

INTRODUCTION

Pterocarpus erinaceus is a plant widely distributed in the savannah regions. The Hausas call it "madobia", the Yorubas "apepe" and the Igbos "Aze egu". The plant is reputed as an effective cure for dysmenorrhoea, Menorrhagia, urethral discharge, and as a blood tonic[1].

Platelets are involved in haemoestasis and their abnormal functions contribute to some complications of essential hypertension[2]. Platelets are present in blood at a concentration of 150-400 x 109/L with a half life of four days[3]. The platelets are released following vascular injury and subsequently form a plug to prevent blood loss[4].

The platelet binding site has been identified as being on a major glycoprotein on its membrane[5]. Collagen, and an initial thrombin formation at an injured site, provokes platelet release, and the subsequent activation of phospholipase C. the end-result is the hydrolysis of the platelet membrane inositol(6). Platelet functions also depend on the release of adenosine diphosphate in platelets(7).

The aim of this study is to investigate the effects of P. erinaceus extract on platelets count and functions.

Methods: The dry bark of pterocarpus erinaceus was soxhlex extracted in ethanol and in distilled water for 72 hours. The extracts were concentrated on a rotatory evaporator and stored at room temperature.

Seventy-five rats from the Animal House, University of Jos, fed and libitum were grouped into three. Group 1 received distilled water, group 2, the aqueous extract of P. erinaceus, and group 3, the ethanolic extract. The dose of the extract of P. erinaceus used was 0.26g/100ml/body weight, for two months.

Platelet count, prothrombin time bleeding time, and clotting time, were determined using the method of Dacie and Lewis as described by Ibu and Adeniyi(8). The results are analysed using paired t-test.

Results: Table 1: Platelet Count and functions following the administration of pterocarpus erinaceus.

MEAN

Group	PC(x109/L	BT(Mins)	CT(Mins)	PT(Secs)
1 (control)	294.6	1.34	1.60	15.4
3 (ethanolic)	256.2	2.38	2.91	19.0
2 (aqueous)	303.6	2.01	1.16	15.8

PC=Platelet Count
BT=Bleeding Time
CT=Clotting Time
PT=Prothrombin Time

In the control group the mean (+SEM) bleeding time, clotting time, prothrombin time and platelet count are: 1.344 + 0.05 mins, 1.60 + 0.44 mins, 15.4 + 30 secs and 294.6 + 19.0 x 109/L respectively.

Following the administration of the aqueous bark extract of P. erinaceus, the result are: BT, 2.01 + 0.38 mins; CT, 1.16 + 0.50 mins; PT, 15.8 + 2.56 secs and PC, 303.6 + 24.5 x 109/L as mean (+SEM) respectively. The results following the administration of the ethanolic extract of the bark of P. erinaceus are: BT, 2.38 + 0.19 mins, CT, 2.9 + 0.59 mins, PT, 19.0 + 0.83 secs, and PC 256.2 + 19.9 x 109/L respectively.Analysis of the levels of significant differences between the study groups (Table 2) shows significant differences between the groups on ethanolic extract and control, ($P<0.05$); aqueous and control ($P<0.05$) for the bleeding time. There was no significant difference in bleeding time between the groups on aqueous and ethanolic extracts ($P>0.05$). for clotting time, significant difference was observed between the ethanolic extract group and the control group ($P0<0.5$). there was also a significant reduction in platelet count in the group on ethanolic extract compared with the control ($P<0.05$).

TABLE 2: Comparism of Levels of Significant Differences between the study groups

Group	PC	BT	CT	PT
C, AE	P>0.05	P<0.05	P>0.05	P>0.05
C, EE	P<0.05	P<0.05	P<0.05	P<0.05
AE, EE	P>0.05	P>0.05	P>0.05	P>0.05

Keys C= Control Group
AE=Aqueous extract group
EE=Ethanolic extract group

Discussion: The extracts of pterocarpus erinaceus significantly raises the bleeding time. The effect of the ethanolic extract of pterocarpus erinaceus on platelet count and functions as found in this study collaborates earlier reports[7,9]. Alcohol alters the platelet cell membrane and this may explain the prolonged bleeding time. The clotting time significantly increased with the alcoholic extract of P. erinaceus, but decreased with the aqueous extract. Only the ethanolic extract prolonged the prothrombin time. The platelet count significantly reduced with the administration of the ethanolic extract of P. erinaceus. This could possibly be due to the alcoholic creation of platelet cells.

The ethanolic extract of the bark of pterocarpus erinaceus appears to be more effective than the aqueous extract. The alcoholic extract raised bleeding time, clotting time and prothrombin time, but reduced platelet count. It is suggested that the plant P. erinaceous indeed inhibits platelet functions and could cause some bleeding disorders, especially in predisposed individuals.

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