

The Effect Of Ricinus Communis Variety Minor On Reproductive Organs Of The Wistar Rat And Haematological Indices In Women Volunteers.

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ABSTRACT

OBJECTIVES

To determine the effect of the extract on reproductive organs of the wistar rat and its reproductive cyclicity and also to determine the safety of the extract in women volunteers who have been on it for between 1-10 years with respect to their haematological indices.

MATERIALS AND METHOD

The seed extract of Ricinus Communis variety minor given in a dose of 1.2kg/kg body weight to female wistar rats subcutaneously. The oestrous cycle were studied and the ovaries and uteri were obtained, fixed in Boiun's fluid and prepared for Haematoxylin and Eosin(H&E) staining for histology. Similarly, the ante-cubital venous blood of women already on the seed as a means of family planning were obtained and their haematological indices determined.

RESULTS.

The estrous cycle of the rats were distorted. Furthermore, this seed extract induced changes in the ovarian and uterine histology, which may be due partly to alteration in the estrogen/ progesterone balance, as well as direct effect on these reproductive organs. Hematological indices were not affected in women volunteers who have been on the plant seed of as 3 seeds as a single dose as a means of family planning.

CONCLUSION

The seed extract distorted the oestrous cycle of the female wistar rat. It did not adversely affect the haematologic indices which may suggest its safety from some known haematological complications of family planning pills such as thrombo-embolism etc.

KEY WORDS: Ricinus communis, Reproductive organs, women volunteers.

INTRODUCTION

Several plants and herbs have been reported to have potential anti-conceptive properties, with increasing interest in research in this area in developing countries^(1,2). In traditional medical practices in Plateau State, Nigeria, seeds and leaves of various plants have been used as anti-fertility agents in family planning. The seeds of Ricinus Communis Var. Minor are present in abundance from plants growing the middle belt (Plateau) region of the North Central zone of Northern Nigeria, and had long been used as an anti-fertility(family planning) agent among the women of the tribes of Bassa L.G.A in Plateau state. When taken as 3 seeds orally as a single dose, it offers protection against pregnancy for a period of 12 months⁽⁸⁾. A survey of the seeds of this plant revealed its high acceptability as a means of family planning among our women in this part of the region. Similarly, its anti-fertility efficacy in female rodents has been reported⁽¹⁰⁾. Pharmacological studies on the anti-fertility effect on the seed extract on rodents and preliminary

clinical investigations on women volunteers revealed that it may act directly on the uterus or by disturbing the oestrogen/progesterone balance and that the women volunteers exhibited no clinical complication attributable to family planning pills and are free from chemical pathological abnormalities^{9,11}. In recent years attention has been focused on medicinal plants and natural products for remedies, including family planning means. Since *Rinus communis* seed has been in long use among women in Bassa L.G.A as a means of child spacing and family planning, and the fact that this claim has been proved in rodents⁽⁸⁾, it is necessary to establish the possible mechanism of action of the seed on the reproductive organs and also to determine if the seed that has been in use in this society is free of adverse effects, especially on haematological indices.

In order to provide an insight into its mechanism of action in the female wistar rat, and to further assess its anti-fertility efficacy, the effect of the seed extract was evaluated on the reproductive organs/system. In addition hematological indices of women volunteers who had been on the seed as a means of family planning for between 1-10 years were assessed to determine if there is any adverse effect on these indices.

MATERIALS AND METHODS

The seeds of *Ricinus Communis* Var. Minor were collected in Jos plateau state of Northern Nigeria. The extract was prepared as described by (8) to give a yield of 45g(64.4% w/w) of the Diethyl fraction.

Twenty mature female wistar rats weighing between 150-200g were obtained from the animal house of the university of Jos inbred in a cross-ventilated room and allowed 12 hours light and 12 hours darkness. The animals were fed with rat chow and water ad libitum. Daily weights and vaginal smears were obtained by flushing with saline to determine their Estrous cycle. These were found to be four (4) days cyclic rats after smear determination for 14 days. The rats were divided into 4 groups of five rats each.

Groups 1 and 2(experimental, extract treated) received 1.2kg/kg body weight of the extract suspended in corn oil as a single dose subcutaneously. Groups 3 and 4 (control) received 0.2mls of corn oil and physiological saline as single doses subcutaneously respec-

tively. Daily weights and vaginal smears were continued for eight weeks after the extract administration to determine estrous cyclicity. The animals were sacrificed by cervical dislocation and the uteri and ovaries removed, weighed and fixed in Boiun's fluid. These organs were then processed and stained by haematoxylin and eosin (Hand E) method of histological studies (4) and examined under the light microscope. The ovarian/uterine weight ratios in the experimental and control groups were calculated as mean weight of ovaries divided by mean weight of uteri in each group.

Blood samples were obtained from the ante-cubital veins of the Thirty-four (34) women volunteers who had been on the seed for between. 1-10years as a means of family planning. The blood samples were put in heparanized specimen containers for the assessment of routine hematological indices according to the methods of Dacie and Lewis(3).

RESULTS

Normal estrous cycle was distorted in the extract treated groups compared to controls. There was no significant difference in the ovarian/uterine weights ratio (0.02 \pm 0.01) compared to that of the control (0.02 \pm 0.03). Histological changes observed in the ovaries of the extract treated group include the presence of numerous corpora lutea; increase vacuolation within the lutea, presence of macrophages and some atretic follicles.

The uterine endometrium revealed some degree of inhibition of endometrial proliferation, as evidence by poor development of endometrial glands and stoma. The presence of macrophages laden with golden brown haemosiderin pigments in the extract treated organs is indicative of macrophage proliferation in response to direct effect on these organs.

Hematological indices which include Packed cell volume (PCV), Red cell count, Reticulocytes count(Retics), Platelet counts, White blood cell count(WBC), Neutrophils(Neut.), Lymphocytes(Lymp.), Monocytes(Mono), Eosinophils(Eos.), Basophils(Baso) and Band forms in the women volunteers were within normal range (3) as presented in Table 1.

TABLE 1. HAEMATOLOGICAL INDICIES IN WOMEN VOLUNTEERS ON RICINUS COMMUNIS.

NAME	PCV(%)	HB(g/l)	RBC(x10)	RETICS	PLATE	WBC(T)	NEUT	LYMP	MONO	EOS	BA	SO/
	BANDSO											
ET	42	14.1	4.8	-	245	4.1	2.5	1.3	0.2	0.1	-	-
JM	32	10.5	3.7	-	410	3.6	1.7	1.9	0.04	-	-	-
AA	34	12.1	4	-	152	5.1	2.6	2.0	0.2	0.4	-	-
AA	38	12.5	4.3	-	598	5.7	3.3	2.2	0.2	-	-	-
AA	44	14.0	4.9	-	312	6.0	2.6	3.6	-	0.6	-	-
AA	42	13.5	4.6	-	487	4.4	2.2	2.0	0.3	-	-	-
R	37	12.4	4.2	-	390	6.8	4.8	1.8	0.1	0.7	-	-
S	39	13.1	4.5	-	103	4.2	2.2	1.6	0.2	0.2	-	-
AA	37	12.5	4.3	-	198	4.8	3.2	1.6	-	-	-	-
G	37	13.0	4.4	-	173	5.3	3.1	2.0	0.3	-	-	-
AJ	38	13.1	4.5	-	231	4.0	1.8	1.8	0.5	-	-	-
ES	35	13.1	4.1	-	354	6.0	3.4	2.4	0.1	0.06	-	-
AA	40	13.4	4.6	-	105	4.9	2.9	2.0	0.05	0.1	-	-
ZL	41	14.0	4.7	-	268	6.3	3.2	3.2	-	-	-	-
M	32	10.1	3.9	-	336	6.1	3.4	2.5	0.4	-	-	-
AA	35	12.8	3.9	-	240	4.8	1.8	3.0	0.05	0.05	-	-
SS	35	11.6	4.1	-	210	5.1	3.1	1.9	0.1	-	-	-
JL	41	13.0	5.8	-	424	4.1	2.7	1.3	0.1	-	-	-
AS	42	13.4	4.9	-	217	5.0	2.6	2.5	0.1	-	-	-
CS	42	13.0	3.8	-	198	4.9	2.5	2.1	0.3	0.05	-	-
AG	43	13.5	5.2	-	580	6.0	3.4	2.5	0.1	-	-	-
MJ	40	13.0	4.9	-	112	5.6	4.0	1.5	0.06	-	-	-
AA	36	12.0	5.0	-	168	6.5	3.3	2.7	0.6	-	-	-
AY	38	12.6	4.4	-	370	4.4	2.2	1.9	0.3	-	-	-
TA	39	12.8	4.3	-	282	5.8	3.7	2.1	0.6	-	-	-
JJ	41	13.5	4.9	-	516	6.6	3.2	3.0	0.4	-	-	-
TD	38	12.6	4.5	-	168	6.8	4.6	2.0	0.3	-	-	-
AD	41	12.5	4.7	-	160	4.0	1.8	1.9	0.2	0.1	-	-
RT	38	11.8	4.4	-	310	6.8	4.6	2.2	-	-	-	-
MA	42	13.0	4.8	-	260	4.8	2.5	2.2	0.1	-	-	-
V	39	12.2	4.8	-	150	5.5	2.3	2.4	0.1	-	-	-
ZJ	43	12.8	4.9	-	380	7.0	2.8	3.9	-	0.3	-	-
RE	40	12.6	4.6	-	250	5.6	2.7	2.4	0.3	0.1	-	-

DISCUSSION

The results of our study revealed that Ricinus Communis Variety minor seed extract distorted the estrous cycle and altered the ovarian and uterine histology/histoarchitecture of the female wistar rats, without adverse effect on hematological indices in women volunteers. The changes in the uterine histoarchitecture, which is partly suggestive of estrogen action supports earlier report of the effect of the diethyl fraction of Ricinus communis in the wistar rat⁽¹⁰⁾. Administration of estrogen to rats is known to induce such changes in the uterus and vagina^(5,14,1).

Histological changes in the ovary, which included numerous corpora lutea and some vacuolations within the follicles, suggest the release of immature ova from the ovary. Further more, our finding of alteration in estrous cyclicity and poor development of endometrial stroma and macrophage infiltration, may be associated with low Leutinizing (LH) and Estrogenic activity respectively^(6,13,7). These effects on the estrous cycle, ovary and the uterine endometrium, indicates that Ricinus Communis seed extract may cause some changes in the estrogen/progesterone balance, and thus interfere with the hypothalamo-pituitary-ovarian axis, although the extend to which this may be responsible

for its anti-fertility efficacy, cannot be ascertain from the present study. An understanding of the nature of the interference, may throw more light on the mechanism of action of this plant seed extract on the female reproductive system. Similarly, histochemical and ultra structural studies on the female reproductive organs may reveal any further direct effects of the extract on these organs which might not be detectable by H&E staining technique for histology.

Hematological indices were not adversely affected. This may explain the absence of major side effects associated with family planning pills such as cardiovascular and thromboembolic disorders⁽¹²⁾, which were all absent in the women volunteers. This further supports the previous report of this extract on preliminary clinical investigation on women volunteers.⁽⁹⁾.

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