FIELD TRIAL OF SAUSSURFA LAPPA ROOTS AGAINST NEMATODES AND NIGELIA SATIVA SEEDS AGAINST CESTODES IN CHILDREN

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ABSTRACT

Antinematodal efficacy of Saussurea lappa roots (Qust-e-Shereen) and anticestodal effect of Nigella sativa seeds (Kalonji) was studied in children infected naturally with the respective worms. The activities were judged on the basis of percentage reductions in the faecal eggs per gram (EPG) counts. The 50 mg/kg single dose of S. lappa and equivalent amount of its methanolic extract produced on days 7 and 15 percentage EPG reduction similar to 10 mg/kg of pyrantel pamoate. Similarly, single oral administration of 40 mg/kg of N. sativa, equivalent amount of its ethanolic extract and 50 mg/kg of niclosamide reduced the percentage of EPG counts not significantly different from each other on the days 7 and 15. Therefore, it is conceivable that these indigenous medicinal plants contain active principles effective against nematodes and cestodes. The crude drugs did not produce any adverse side effects in the doses tested (JPMA 41 :185, 1991).

INTRODUCTION

Rational control of helminthic infections involves the regular use of the appropriate anthelmintic drugs[1]. However, continuous administration of the drugs led to the development of resistance[3]. Moreover, synthetic anthelmintics are well known to possess several adverse and/or side effects. Thus alternate therapeutic agents for the helminthic infections are needed to be constantly discovered.

The roots Saussurea lappa (family: Compositae) and seeds of Nigella sativa (family. Ranunculaceae) have been quite commonly used in “Unani” medicine for treatment of various diseases[3]. The medicinal properties ascribed to these plant drugs include anthelmintic, anti-infectious, antiasthmatic, antiphiegmatic, antiflatulant, diuretic and tonic. In addition, these medicinal plants have been used to cure paralysis, skin diseases, cough, rheumatism, epilepsy, cholera and dyspepsia[4,5] Akhtar et al.6 have reported that Saussurea lappa roots and Nigella sativa seeds possess anthelmintic principles which are effective respectively against gastrointestinal nematode and cestode infections of domestic animals. However, these antiparasitic activities have not been studied in humans so far. Therefore, a field trial was conducted to evaluate the efficacies of Saussurea lappa roots (Qust-e-Shereen) against nematodes and Nigella sativa seeds (Kalonji) against cestodes in children.

PATIENTS AND METHODS

A total of thirtysix children under 12 years of age naturally infected with the mixed nematodes predominantly harbouring Ascaris lumbricoides and another group of thirty-six children of the same age infected with the mixed cestodes, predominantly having Taenia saginata and Hymenolepsis nana were included in the study with the consent of parents. They were divided into six groups of six each. All children were being kept under practically similar hygienic and socio-economic conditions.

Pre and post treatment eggs counts per gram (EPG)

were done by McMaster Egg Counting Technique described by Soulsby[7].

Administration of drugs

The roots of Saussurea lappa locally (Qust-eShereen) and seeds of Nigella sativa (Kalonji) were purchased from a local herbal dealer and were made free from dust and other adulterations. They were dried in incubator at 40°C, finely powdered and kept in the refrigerator in airtight glass bottles.

A group of six children suffering from mixed nematode or ëestode infection was kept as untreated control, while another group was treated orally with 10 mg/kg body weight pyrantel pamoate (Combantrin)[8] or 50 mg/kg of Niclosamide (Yomesan)[8]. The other three groups were treated with 30, 40 and 50 mg/kg body weight of Saussurealappa powder or 20,30 and 40mg/kg of Nigella satin powdered seeds. Post-treatment faecal EPG counts were checked on days 3,7 and 15 by the same technique.

The data obtained were expressed as Means + SEM (Standard Error of Means). The percentage EPG reductions were calculated and the Student's 't' test was used to determine the significance of the differences in the groups[8].

RESULTS

TABLE I. Faecal eggs per gram (EPG) counts and their percentage reductions in children suffering from a mixed gastrointestinal nematode infection before and after treatment with saussurea lappa roots and combantrin (R).

Treatment	Single oral dose	Pretreatment faecal EPG counts	Post- treatment EPG counts			Post-treatment percentage EPG reductions		
			day 3	day 7	day 15	day 3	day 7	day 15
Untreated control	-	1516 ± 400	1580 ± 412	1627 ± 386	1820 ± 320	-	-	-
Pyrantel pamoate (Combantrin (R) treated control)	10 mg/kg	2000 ± 360	480 ± 150**	155 ± 98**	45 ± 19**	76 ± 3	92 ± 3	98 ± 2
Powdered Saussurea lappa roots (Qust-e-Shereen)	30 mg/kg	2617 ± 409	1625 ± 233*	1175 ± 178**	1025 ± 166**	30 ± 3	50 ± 2	56 ± 3
	40 mg/kg	2150 ± 152	1300 ± 163*	400 ± 123**	100 ± 103**	40 ± 3	82 ± 4@	56 ± 5@
	50 mg/kg	2017 ± 314	800 ± 94**	280 ± 66**	80 ± 37**	60 ± 5	86 ± 3@	96 ± 3@
Methanolic extract of Saussurea lappa roots	≈50 mg/kg	237 ± 204	926 ± 88**	336 ± 60**	48 ± 20**	61 ± 4	86 ± 3@	98 ± 3@

No. of children in each group = 6

* = Significantly ($P < 0.05$) EPG counts than respective pre- treatment values

** = Highly significantly ($P < 0.001$) EPG counts than respective pre-treatment values

@Non-significantly ($P > 0.05$) different the respective values of Combantrin treated group

Table I shows that nematodal EPG counts in the faeces of untreated patients did not change significantly (P> 0.05) at all time intervals checked. A single oral administration of 40 and 50 mg/kg of powdered Saussurea lappa roots have reduced EPG count significantly (Pc0.05 or 0.001) on days 7 and 15 with percentage reductions similar to those achieved with 10 mg/kg of pyrantel pamoate. The methanolic extract of S. lappa in doses equivalent to 50 mg/kg also produced the same results.

In the children treated with 20, 30 and 40 mg/kg of the powdered Nigella sativa seeds, the cestodal faecal EPG counts were significantly (Pc0.05 or 0.001) decreased. However, the percentage EPG reductions were similar to the control drug, 50mg/kg of Niclosamide with 40mg/kg of N. satin on days 7 and 15 (Table II).

TABLE II. Faecal eggs per Gram (EPG) counts and their percentage reductions in children suffering from a mixed gastrointestinal Cestode infection before and after treatment with Nigela Sativa seeds and Yomesan (R).

Treatment	Single oral dose	Pretreatment faecal EPG	Post-treatment EPG counts			Post- treatment percentage EPG counts reduction		
		counts	day 3	day 7	day 15	day 3	day 7	day 15
Untreated Control	-	1826 ± 312	1910 ± 400	1991 ± 416	2015 ± 416	-	-	-
Niclosamide (Yomesan (R)	50 mg/kg	2275 ± 210	1050 ± 315**	672 ± 201**	262 ± 182**	53 ± 6	74 ± 4	89 ± 4
Powdered Nigella sativa	20 mg/kg	2350 ± 352	1625 ± 233**	1175 ± 178**	1005 ± 166**	32 ± 3	50 ± 2	58 ± 4
Seeds	30 mg/kg	1950 ± 305	1300 ± 211**	800 ± 200**	575 ± 166**	33 ± 5	59 ± 3	68 ± 3
(Kalongi)	30 mg/kg	1952 ± 129	1107 ± 73	427 ± 66**	155 ± 40**	43 ± 3	78 ± 4@	92 ± 3@
Ethanol Extract of Nigela sativa Seeds	≈ 40 mg/kg	1750 ± 167	733 ± 67**	340 ± 46**	130 ± 32**	58 ± 2	80 ± 4@	93 ± 3@

No. of children in each group = 6
* = Significantly ($P < 0.05$) EPG counts than respective pre- treatment values
** = Highly significantly ($P < 0.001$) EPG counts than respective pre-treatment values
@ = Non-significantly ($P > 0.05$) different the respective values of Yomesan (R)

In addition, the ethanolic extract of N. sativa equivalent to 40 mg/kg of the crude powder also produced similar results which is a remarkable efficacy.

DISCUSSION

S. lappa roots and N. sativa seeds respectively possess significant antinematode and anticestodal activities. Their most effective oral doses were 50 and 40 mg/kg body weight and they did not have any serious side or adverse effects. Recently, oral treatment of the domestic animals with these indigenous medicinal plant drugs produced antinematodal and anticestodal efficacies similar to the present study[9]. The present studies do encourage the possible use of these cheap indigenous plant drugs as they have proved to be potent and safe agents for the treatment of children against round and tape worm infestations. However, further comprehensive chemical, pharmacological and chronic toxicological investigations are yet needed to elucidate their exact mechanisms of anthelmintic actions and to isolate their active principle(s).

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