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Evaluation of Polyherbal formulation for Diuretic activity and Antiseptic activity

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Abstract
The diuretic activity was assessed by using Electrolyte excretion at the dose 1000 mg/kg of herbal mixture increases Na^+, K^+ and Cl^-, when compared to the control group. At a dose 1000 mg/kg of Herbal mixture the urine output is compared with standard drug as well as control group of animals. Electrolyte excretion at the dose 1000 mg/kg of the herbal mixture increases Na^+,K^+ Cl^- and when compared to the control group. The highest zone of inhibition was measured against P. vulgaris, whereas, least in K. pneumoniae at 1000µg/ml of polyherbal mixture when compared to the control group of fungus.
Keywords: Electrolyte, Diuretic activity and Antiseptic activity

Introduction

Abnormalities in fluid volume and electrolyte composition are common and important clinical problems that can become life—threatening if untreated. Drugs that block the transport functions of the renal tubules are important clinical tools in the treatment of these disorders. Diuretics increase the rate of urine flow and sodium excretion and are used to adjust the volume and I or composition of body fluids in a variety of clinical situations, including hypertension, heart failure, renal failure, nephrotic syndrome and cirrhosis. Technically, the term "diuresis" signifies an increase in urine volume, while "natriuresis" denotes an increase in renal sodium excretion. By definition, diuretics are drugs that increase the rate of urine flow; however, clinically useful diuretics also increase the rate of excretion of Na (Natriuresis) and of an accompanying anion, usually C1--Sodium chloride in the body is the major determinant of extra cellular fluid volume (Staphylococcus aureus and Bacillus subtilis and two fungal strains like, Cadida albicans and Aspergillus niger.

Diuretic activity

The diuretic activity was assessed as follows each animal was placed in an individual metabolic cage 24 h prior to commencement of the experiment for adaptation. Rats were fasted overnight with free access to water. The animals were divided into six groups of six rats each and subjected to treatment in the

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morning. The Group I kept as control and received only saline orally at 2 ml / kg b.w.Group II (vehicle) of rats received 1% CMC and group III received the diuretic compound Frusemide (Aventis Pharma, Lasix) (40 mg/kg in 0.1m1/kg b.w.). Groups IV, V and VI herbal mixtures were administered orally along with 1% CMC. The urine was collected and electrolytes such as Na^+, K^+ and Cl^- were measured at 24 h after administration. Urinary electrolytes like sodium, potassium were estimated by Flame photometer and chloride by Spectrophotometer.

Antiseptic activity

The antibacterial activity of herbal mixture was determined by the agar well diffusion method Mahajan et al.,(1999) against seven bacterial strains like, five gram negative (Pseudomonas aeruginosa, Escherichia coli, Proteus vulgaris, Proteus mirabilis and Klebsiella pneumoniae -and two Gram positive (Staphylococcus aureus and Bacillus subtilis and two fungal strains like, Cadida albicans and Aspergillus niger. The micro-organisms were subcultured and maintained on nutrient agar (Hi-media) slant. A standardized concentration of 10^8 cells mL^{-1} was used in experimentation. Each culture was swabbed on the surface of sterile nutrient agar plate in duplicate. In each agar plate, four wells were prepared with the help of sterilized cork borer of 10 mm diameter. Ten gm herbal mixture powder mixed in 40 ml distilled water and boiled up to one fourth of total volume, filtered through muslin cloth and final dose adjusted to 1000µg/mL. In the wells of respective group of 100µl/mg; 10µg/mL Gentamicin and phosphate buffer saline were added aseptically by using micropipette.

Statistical analysis

Data analysis was carried out by using Analysis of variance (ANOVA). For post hoc comparison Boneferroni's test was employed. The statistical analyses were carried out usingGraph Pad Prism 4, statistical software.

Results and Discussion

Electrolyte excretion at the dose 1000 mg/kg of the herbal mixture increases Na^+,K^+ and when compared to the control group. At a dose 1000 mg/kg of Herbal mixture the urine output is compared with standard drug as well as control group of animals.

The highest zone of inhibition was measured against *P*. vulgaris (12.43 ± 2.73mm), whereas, least in *K*. pneumoniae (9.57 ± 2.75mm) at 1000µg/ml of polyherbal mixture when compared to the control group of fungus. The zone of inhibition was measured against *A*. niger (10.14 ± 2.34mm), whereas, in *C*. albicans (10.14 ± 2.34 mm) at 1000µg/ml of polyherbal mixture when compared to the control group.

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Table 1 Effect of polyherbal mixture on urinary electrolytes

Groups	Na^+(mEq/L)	K^+(mEq/L)	Cl^-(mEq/L)
Control	42.17 ± 0.94	29.0 ± 1.41	12.10 ± 0.13
Vehicle	42.17 ± 0.94	27.33 ± 1.85	12.15 ± 0.12
Standard	48.67 ± 2.07	36.17 ± 1.10	12.85 ± 0.13
Hm 250 mg/kg	41.83 ± 1.60	26.83 ± 0.79	11.50 ± 0.28
Hm 500 mg/kg	42.33 ± 1.60	33.33 ± 1.43*	12.20 ± 0.16
Hm 1000 mg/kg	43.33 ± 1.99**	33.83 ± 2.04**	12.65 ± 0.23**

N = 6, Values are expressed as Mean ± S.E. *p<0.05, **p<0.01

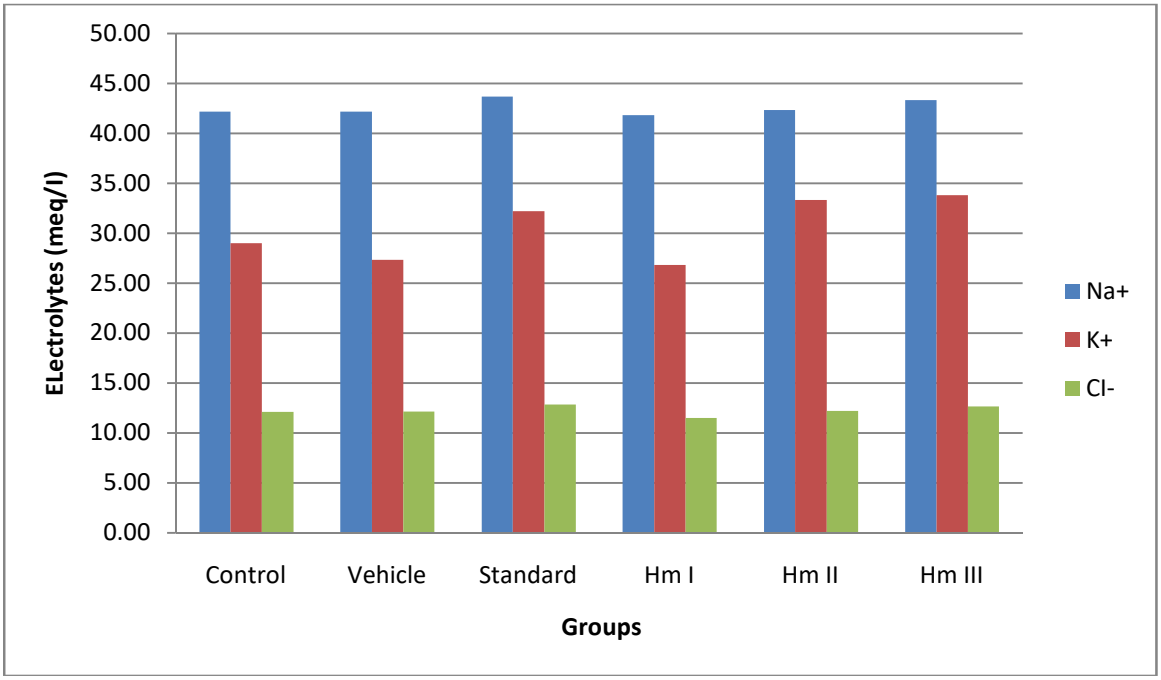

Fig. 1 Diuretic activity of polyherbal formulation

Table 2 Effect of Herbal mixture on Urine output

Groups	Urine Volume (ml)
Control	4.8 ± 0.36
Vehicle	4.5 ± 0.40
Standard	6.5 ± 0.31
Hm 250 mg/kg	4.8 ± 0.38
Hm 500 mg/kg	506 ± 0.10
Hm 1000	5.8 ± 0.15*

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mg/kg	

N = 6, Values are expressed as Mean ± S.E. *p<0.05

Table 3 In vitro antibacterial activity of the Herbal mixture.

Microorganism	Gentamicin (10 µg/mL)	Herbal Mixture (1000 µg/mL)
Control	00.00 ± 0.00	00.00 ± 0.00
Escherichia coli	19.43 ± 0.10	09.85 ± 2.20
Staphylococcus aureus	18.71 ± 0.18	10.14 ± 2.50
jPseudomonas aeruginosa	20.29 ± 0.42	10.00 ± 2.30
Bacillus subtilis	18.14 ± 0.40	09.85 ± 2.13
Proteus vulgaris	17.57 ± 0.48	12.43 ± 2.73
Proteus mirabilis	20.43 ± 0.36	10.14 ± 1.99
Cadida albicans	20.71 ± 0.35	10.14 ± 2.34
Klebsiella pneumonia	16.86 ± 1.18	09.57 ± 2.75
Aspergillus niger	20.29 ± 0.42	10.14 ± 2.34

Conclusion

The present study showed that polyherabal formulation has got antibacterial and antifungal activity as compared to standard gentamicin at a dose of 1000 g/ml. The polyherbal formulation showed moderate to mild antimicrobial activity against most of the tested bacteria and fungi. It may be concluded that polyherbal formulation is active against the tested microorganisms.

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