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RESEARCH ARTICLE

Diuretic Activity of *Sufoof-e-Suzak Qawi* an Unani Polyherbomineral Formulation

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ABSTRACT

The *Suffof-e-Suzak Qawi* is an unani polyherbomineral formulation and is being used in the alternative system of medicine for its anti-gonorrheal and diuretic activity. It is an official monograph in national formulary of unani medicine (NFUM) and reported as anti-gonorrheal and diuretic. The aqueous suspension of the formulation was studied for its possible diuretic activity and its effect on urinary sodium and potassium excretion. The results were compared with animal groups treated with vehicle and standard drug furosemide. When tested in healthy adult rats the formulation at a dose of 500, 750 and 1000 mg/kg has shown increase in the urinary output and urinary sodium excretion but not any increase in the urinary potassium excretion at all dose levels. The present study showed that, the aqueous suspension of *Suffof-e-Suzak Qawi* has diuretic activity comparable with the standard drug furosemide in producing urinary output and urinary sodium excretion and has no effect on urinary potassium excretion.

Keywords: *Saluretric, Diuretic, ISM & H, Alternative system of medicine, Unani*

The *Sufoof-e-Suzak Qawi* (SESQ) is an unani polyherbomineral formulation with official monograph in NFUM and it has been reported an as anti-gonorrheal and diuretic [1]. It is a powdered formulation which contains 10 different plant/mineral constituents: Samag-e-darakte-e-beer (*Zizyphus jujuba*), Gul-e-tesu (*Butea monosperma*), Satt-e-gilo (*Tinospora cardiofolia*), Satt-e shilajit (Asphaltum), Rewand chini (*Rhem officinalis*), Tabashir (*Bambusa bambos druce*), Dhana heel khurd (*Elletaria cardamomum*), Jawakar (Potassium carbonate), Shora qalmi (Potassium nitrate) and Nabat safaid (Sucrose). Some of its constituents are known medicines and reported as depurative, diuretic, anthelmintic, anticonvulsant, giardiasis, antihepatotoxic, bactericidal and fungistatic (*Butea monosperma*) [2-5], antidiarrhoeal, fever, antiulcer and old wound (*Zizyphus jujube*) [6], bittertonic, astringent, potent aphrodiasic (*Tinospora cardiofolia*) [7, 8], free radical scavenging activity (Asphaltum) [9], stomachic, tonic, cathartic properties, astringent (Rhubarb) [10], generally given in fever to assuage thirst, expectorant (Tabashir) [11], powerful aromatic, stimulant, carminative, stomachic and diuretic (*Elletaria cardamomum*) [12-14]. Some of the constituents of SESQ (*Butea monosperma*, *Tinospora cardiofolia* and *Elletaria cardamomum*) are reported as diuretic agents. With this background the diuretic activity of SESQ was carried out to finds its possible effect on urinary excretion including urine sodium and potassium excretion.

MATERIALS AND METHODS

Drug Sample

The formulation was procured from Center Council for Research on Unani Medicine (CCRUM), Hyderabad, under the project of ISM & H for standardization work. The same sample was used as received for the studies. The formulation was given orally as 2.5 % gum acacia suspension at different dose levels. The suspension was prepared by triturating the powdered formulation with 2.5% gum acacia in a glass mortar unidirectionaly with water.

Experimental Animals

Studies were done on healthy male albino rats weighing about 200-250 g and the animals were obtained from college animal house and permission was taken from institutional animal ethical committee. The animals were housed in animal house and kept in 12 hr light dark cycle, and allowed to access food and water *ad libitum*, except the brief period during the experiment. Rats were divided into five groups each of six animals. Group I received 2.5 % gum acacia solution

Table 1. Shows the effect of aqueous suspension of Sufoof-e-Suzak Qawi on urinary output at doses of 500,750 and 1000 mg/kg orally.

Sl. No.	Treatment	Volume of urine collected for 24 h (mL) Mean ± SEM
01	Control	7.7± 0.59
02	SESQ 500 mg/kg	9.78± 0.78*
03	SESQ 750 mg/kg	11.61± 1.02*
04	SESQ 1000 mg/kg	12.53 ± 0.80*
05	Furosemide 5 mg/kg	13.98 ± 0.80***

Stat significance * p<0.05 s *** p<0.001 h

(vehicle treated), group II – IV received aqueous suspension of powdered formulation at a dose of 500, 750 and 1000 mg/kg and group V received standard drug Furosemide 5 mg/kg. All doses were given with 25 mL/kg saline.

Measurement of Diuretic Activity

Method of Lipschitzs et al. 1943 [15] was followed Rats were fasted overnight and treated with vehicle, aqueous suspension of the powdered formulation at different dose levels and standard drug as stated above along with 25 mL/kg saline. The rats were placed in metabolic cages individually as soon as the treatments. The urine sample was collected after 24 h and measured by using a standard measuring cylinder. The amount of urine collected for 24 h was compared with that of control and standard drug treated groups.

Measurement of Urine Sodium and Potassium Level

Estimation of Sodium and Potassium content of the urine samples treated with drug suspension at different doses as well as other groups were done by using a lab model Mediflame photometer. The urinary Sodium and Potassium content of the formulation treated groups were compared with that of control and standard drug. The effect of drug sample on the Sodium and Potassium urinary excretion was calculated.

Statistical Analysis

The results were expresses as mean ± SEM. All statistical comparisons were made by means of student's t-test and a p-value smaller than 0.05 was considered as significance.

RESULTS

Table 1 shows that the urine volume collected for 24 hours for vehicle and formulation treated orally at dose levels of 500, 750 and 1000 mg/kg and Furosemide 5mg/kg treated group was found to be 7.7+ 0.59, 9.7+ 0.78, 11.6 + 1.02, 12.5 + 0.80 and 13.9 + 0.80 mL respectively. Table 2 also shows that the urinary sodium content was found to be 1.85+0.04, 2.08+0.07, 3.01+0.10, 3.16+0.11 and 3.32+0.06 meq/L for vehicle, formulation at different dose levels and standard drug treated groups respectively. Table 2 shows that the urinary potassium out put was found to be 0.62+0.02, 0.62+0.02, 0.68+0.16, 0.65+0.01 and 0.78 + 0.02 meq/L for vehicle, formulation at different dose levels and standard drug treated groups respectively.

Table 2. Shows the effect of aqueous suspension of Sufoof-e-Suzak Qawi on urinary sodium and potassium output at doses of 500,750 and 1000 mg/kg orally

Sl No.	Treatment	Sodium (meq/L) Mean ± SEM	Potassium (meq/L) Mean ± SEM
01	Control	1.85± 0.04	0.62 ± 0.02
02	SESQ 500 mg/kg	2.08± 0.07	0.62 ± 0.02
03	SESQ 750 mg/kg	3.10± 0.10***	0.68 ± 0.16
04	SESQ 1000 mg/kg	3.16± 0.11***	0.65 ± 0.01
05	Furosemide 5 mg/kg	3.32 ± 0.06***	0.78 ± 0.02

Stat significance * ** p<0.001 h

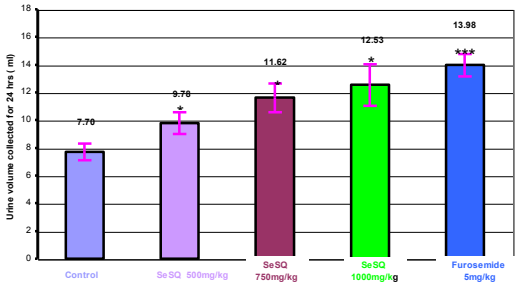

Fig 1. Shows the effect of aqueous suspension of Sufoof-e-Suzak Qawi at a dose of 500, 750 and 1000 mg/kg orally on urinary Sodium Excretion in urine Samples collected for 24 h- meq/L (Mean ± SEM). (Animal used: Rats, n=6)

DISCUSSION

The vehicle, aqueous suspension of the formulation at different doses and standard drug were given orally and urine collected for 24 hrs was measured and Sodium and Potassium content of the urine collected for 24 hrs were estimated. The aqueous suspension of the SESQ has shown significant increase in the urine volume at 500, 750 and 1000 mg/kg dose levels as compared to control and standard drug treated groups under the same condition (Fig 1). The aqueous suspension of SESQ was found to increase the urinary Sodium output (Fig 2) but not potassium at all dose levels (Fig 3).

SUMMARY AND CONCLUSION

The present study showed that the aqueous suspension of the SESQ significantly increases the urine output

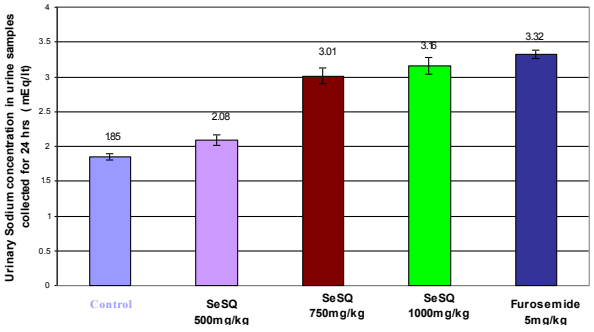

Fig 2. Shows the effect of aqueous suspension of Sufoof-e-Suzak Qawi at a dose of 500, 750 and 1000 mg/kg orally on urine output for 24 h - mL (Mean ± SEM). (Animal used: Rats, n=6).

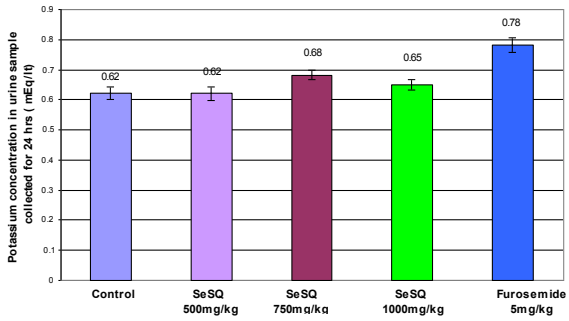

Fig 3. Shows the effect of aqueous suspensions of Sufoof-e-Suzak Qawi at a dose of 500, 750 and 1000 mg/kg orally on urinary Potassium excretion in urine samples collected for 24 h -meq/L (Mean+ SEM). (Animal used: Rats, n=6).

and excretion of urinary Sodium and had no effect on the urinary Potassium excretion. Diuretics have two separate connotations: increase urinary per se and net loss of solute (i.e. electrolytes) and water (i.e. saluretic).

These two processes are involved in the suppression of renal tubular reabsorption of electrolytes, water and low molecular weight organic compounds into the blood stream and as a consequence, promote the formation of urine [16]. An attempt to extrapolate the diuretic action of plant extract/herbs from rat to man using the activity of Furosemide in the organism as a guideline has been reported [17]. The result clearly shows that the aqueous suspension of SESQ at a dose of 500, 750 and 1000 mg/kg administered orally produce significant dose dependant increase in urinary excretion and urinary Sodium loss but no effect on urinary Potassium loss with respect to control and standard drug treated groups. The maximum increase in urine output was 12.5 mL for 1000 mg/kg and maximum Sodium excretion was 3.16 meq/L. These data demonstrate that the formulation has diuretic effect and is as potent as Furosemide. This indicates the use of SESQ in alternative medicine (Unani) as a diuretic agent based on a sound mechanistic background. However the above calculation only provide lead for further investigation of the pharmacological action of SESQ in a more appropriate models like anaesthetized dogs and isolation of active principles and finding the phytochemical(s) responsible for the diuretic activity and the mechanism of action [17].

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