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ADVANTAGES OF NATURAL DIURETICS OVER SYNTHETIC DIURETICS AS A PART OF TREATMENT

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ABSTRACT

Diuretics, in one form or another, have been around for centuries and this review sets out to chart their development and clinical use. Starting with the physiology of the kidney, it progresses to explain how diuretics actually work, via symports on the inside of the renal tubules. The different classes of diuretics are characterized, along with their mode of action. The clinical use of diuretics in conditions like congestive cardiac failure and hypertension. An account of the adverse effects of synthetic diuretics is given along with benefits of natural diuretics over synthetic. Common adverse effects like hypokalaemia and hyponatraemia are prevalent. Medicinal herbs are the significant source as Diuretics. There exist a large number of studies which supports the diuretic effects of traditional herbal medicines. This article reviews the various herbal plants used traditionally as diuretics and chemical constituent of the plant promoting diuresis. This work may mark an important milestone for the researchers in the selection of medicinal plant for carrying their work on diuretics.

KEYWORDS: Natural Diuretics, Herbal Diuretics, Benefits of Natural Diuretics.

INTRODUCTION

The word diuretic has a Greek stem, Diu (through) ovpein (to urinate), and a diuretic is defined as any substance that increases urine flow and thereby water excretion. Diuretics are among the most commonly used drugs .They act by reducing sodium chloride reabsorption at different sites in the nephron, thereby increasing urinary sodium, and consequently, water loss. Paintings found in the ruins of Pompeii have depictions of grapes, ivy, olives and sweet

cherry – all of these have diuretic properties described in the writing of Pliny the Elder (23-79 AD).

A treatise published in 1788 by Joseph Plenick (1735–1807) lists several hundred plants, of which 115 have diuretic properties, including garlic, Chinese lantern, saffron, fennel, liquorice, sassafras and dandelion (*Taraxacum officinale*). The latter derives its name from the French 'dent de lion' (tooth of the lion) on account of the shape of its leaves which impart its diuretic property – probably because of that it is commonly called, in French, 'pissenlit', literally 'piss in bed'. Its diuretic properties are thought to be due to potash (potassium carbonate, K_2CO_3). From 1919 until the 1960s, the most effective diuretics, used as the mainstay of treatment, were the mercurials, but they are no longer used because of their toxicity. Other options during this period were osmotic diuretics like urea, mannitol and sucrose, acidifying salts such as ammonium chloride, xanthine derivatives and digoxin, which has a diuretic effect in addition to its inotropic effect.

In 1937, Southworth realized that patients treated with the antibiotic sulphanilamide not only breathed deeply (they developed a mild metabolic acidaemia) but also produced an alkaline urine, with increased sodium and water excretion. Sulphanilamide was found to be a carbonic anhydrase inhibitor and by 1949, Schwartz had successfully treated congestive heart failure patients with sulphanilamide. Karl Beyer, having heard of Schwartz's clinical success, began searching for and testing a range of sulphanilamide-like agents on animals. Substitution of a carboxy group for the aromatic amino group of sulphanilamide generated carboxy benzene sulphonamide (CBS), also a carbonic anhydrase inhibitor that increased sodium and chloride excretion. Introducing a second sulphamoyl group meta- to the first was found to increase potency, and exploration of substituted disulphamoylbenzene analogues finally led to the discovery of 6-chloro-2H-1, 2, 4-benzothiadiazine-7-sulphonamide-1, 1- dioxide (chlorothiazide), the first thiazide diuretic. It was because the original compounds were benzothiadiazine derivative that this class of diuretics became known as Annals of Clinical Biochemistry 2012; 49: 419–431 thiazide diuretics. Later compounds that were pharmacologically similar to thiazide diuretics but were not thiazides appeared, and acquired the name 'thiazide-like' diuretics, many being heterocyclic compounds like metolazone.

The British National Formulary (BNF) currently lists individual diuretics available for use in the UK but the original one, chlorothiazide, is not among them, although its derivatives,hydrochlorothiazide and benzothiazide, do feature in combination preparations.

They are grouped into familiar categories – thiazides, loop diuretics (also known as high ceiling diuretics), potassium-sparing, osmotic and carbonic anhydrase inhibitors. This review elaborates on each of these and some miscellaneous compounds (caffeine, alcohol and water), and finally discusses some exciting recent developments.

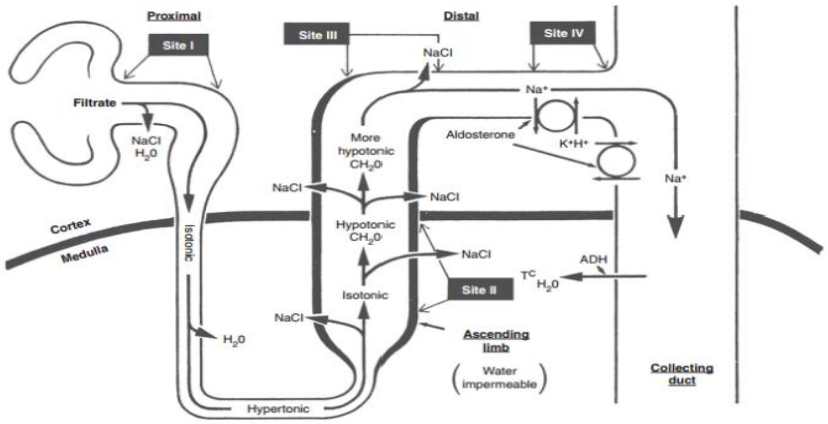

Fig. 1: Diagram of the renal tubule showing principal site of diuretic action.

Role of Kidney in Water Homeostasis: Renal tubular reabsorption of filtered water occurs by osmosis, and, since the glomerular filtrate is essentially isoosmotic, depends on sodium reabsorption to create an osmotic gradient. After formation of a plasma ultrafiltrate in the glomerulus, the tubular fluid enters the proximal convoluted tubule, where specific transporters reabsorb sodium, chloride, bicarbonate, glucose and amino acids. About 60% of the water and most of the organic solutes are also reabsorbed in the proximal tubule. At the boundary between the inner and outer stripes of the outer medulla, the thin descending limb of the loop of Henle´ begins.

The thick ascending limb of the loop of Henle´ actively reabsorbs sodium and chloride from the lumen (about 35% of the filtered sodium), but unlike the proximal tubule and the descending limb, it is virtually impermeable to water. Sodium chloride reabsorption in the thick ascending limb effectively dilutes the tubular fluid, so this segment is called the 'diluting segment.' The loop of Henle´ therefore acts as a countercurrent multiplier producing a gradient of hyperosmolarity in the medullary interstitium. In the distal convoluted tubule, which connects with the diluting segment, around 10% of filtered sodium chloride is reabsorbed. Like the thick ascending limb, the membrane is relatively impermeable to water, so further tubular fluid dilution ensues.

The final arbiter of urine composition is the collecting duct, where 2–5% of sodium chloride reabsorption occurs. Importantly, this is where mineralocorticoids exert their influence, especially aldosterone. Sodium is reabsorbed in exchange for potassium under the influence of aldosterone and it is here that almost all diuretic-induced changes in potassium balance occur. Water is reabsorbed through the action of the posterior pituitary hormone vasopressin (also known as antidiuretic hormone [ADH], although vasopressin is the preferred term) and the final urine to enter the renal pelvis is diluted or concentrated, achieved by the countercurrent mechanism that creates a concentration gradient from 50 mOsm/kg at the outer cortex to 1200 mOsm/kg at the inner medulla.[1]

Definition: Diuretics are the drug which increases the rate of urine formation together with natriuresis. Diuretic are used to adjust volume and/or composition of body fluids in a variety of clinical situation, including hypertention, heart failure, renal failure, nephrotic syndrome and cirrhosis.[2]

Mechanism of Diuretics: Most diuretics exert their action by decreasing renal tubular sodium reabsorption, thereby reducing the luminal-cellular osmotic gradient, which limits water reabsorption and results in a diuresis. With the sole exception of spironolactone and its analogue, all the transporters that they inhibit are on the luminal surface of the tubule, so the diureticagents have to actually ‘get there’ in order to block the symport or uniport transporter.

This means they have to be secreted into the tubular fluid and arrive at their target destination in sufficient concentration to be useful. The process involves facilitated diffusion and in the case of loop diuretics, thiazides and the carbonic anhydrase inhibitoracetazolamide, all of which are acidic, secretion into the tubular fluid, through the organic acid pathway in the proximal tubule. Amiloride and triamterene, being organicbases, enter the tubular lumen via the organic base secretory mechanism, also in the proximal tubule. Spironolactone and other aldosterone antagonists act via a cytosolic receptor and so are delivered to their target area via the blood and the basolateral membrane. If the diuretic is very highly protein bound (96%), then glomerular filtration is limited. Even in hypoalbuminuria, there is not enough ‘free’ drug at one time to get across.Other considerations apply as well and these will beexamined separately, with the diuretic or disease that influences it.

Classification of Diuretics

1. High Ceiling/Loop Diuretics: High ceiling diuretics may cause a substantial diuresis – up to 20% of the filtered load of NaCl (salt) and water. This is large in comparison to normal renal sodium reabsorption which leaves only about 0.4% of filtered sodium in the urine. Loop diuretics have this ability, and are therefore often synonymous with high ceiling diuretics. Loop diuretics, such as furosemide, inhibit the body's ability to reabsorb sodium at the ascending loop in the nephron, which leads to an excretion of water in the urine, whereas water normally follows sodium back into the extracellular fluid. Other examples of high ceiling loop diuretics include ethacrynic acid and torsemide.[3]

Uses

1. Edema.
2. Acute pulmonary edema.
3. Cerebral edema.
4. Hypertension.
5. Hypercalcaemia of malignancy.[4]

Adverse Effects

1. Hypokalaemia.
2. Hypomagnesemia.
3. Dilutional hyponatraemia.
4. Hyperglycemia.
5. Hypovolemia.
6. Hypercholesterolemia.[5]

Drug Interaction

1. Loop diuretics may enhance digitalis toxicity and can cause cardiac irregularities due to hypokalaemia.
2. Serum lithium levels may rise with loop diuretic therapy as they increase the reabsorption of Li^+ from the proximal tubule.
3. Loop diuretics and aminoglycoside antibiotics exhibit additive ototoxisity and should not be used together.
4. Indomethacin and most NSAIDs, by inhibiting $PGE_2$and PGI_2synthesis, diminish the action of high ceiling diuretics.
6. Cotrimoxazole with loop diuretics increases the chances of thrombocytopenia.[6]

2. Thiazide Diuretics: Thiazide type diuretics such as hydrochlorothiazide act on the distal convoluted tubule and inhibit the sodium-chloride symporter leading to retention of water in urine, as water normally follows penetration solutes. Frequent urination is due to the increased loss of water that has not been retained from the convoluted tubule. The short-term antihypertensive action is based on the fact that thiazides decrease preload, decreasing blood pressure. On the other hand, the long-term effect is due to an unknown vasodilator effect that decreases blood pressure by decreasing resistance.

Uses

1. Edema.
2. Hypertension.
3. Diabetes insipidus.
4. Hypercalciuria.[7]

Adverse Effects

1. Allergic manifestations.
2. Hyperuricaemia.
3. Hyperglycaemia and Hyperlipidemia.
4. Hypocalcaemia.
5. Magnesium depletion.

Druginteraction

1. Thiazides potentiate all other antihypertensives. This interaction is intentionally employed in therapeutics.
2. Hypokalaemia induced by these diuretics;

- Enhances digitalis toxicity.
- Increases risk of polymorphic ventricular tachycardia due to drugs which prolong Q-T interval.
- Reduces sulfonylurea action.

3. Carbonic Anhydrase Inhibitors

They inhibit the enzyme carbonic anhydrase which is found in the proximal convoluted tubule. This results in several effects including bicarbonate accumulation in the urine and decreased sodium absorption. Drugs in the class include acetazolamide and methazolamide.

Uses

1. Glaucoma.
2. To alkalinise urine.
3. Epilepsy.
4. Acute mountain sickness.
5. Periodic paralysis.

Adsverse Effects

1. Acidosis.
2. Hypokalaemia.
3. Drowsiness.
4. Fatigue.
5. Abdominal discomfort.
6. Hypersensitivity reactions-fever, rashes.

Drug Intraction

1. On the contrary, CA inhibitors decrease the reabsorption of some acidic drugs (e.g. aspirin, Phenobarbital), thus promoting their excretion.

2. By alkalinizing the tubular fluid, carbonic anhydrase inhibitors promote tubular reabsorption of basic drugs, such as amphetamine and its congeners, thus delaying their eliminaition.

4. Potassium-Sparing Diuretics

These are diuretics which do not promote the secretion of potassium into the urine; thus, potassium is retained and not lost as much as with other diuretics. The term "potassium-sparing" refers to an effect rather than a mechanism or location; nonetheless, the term almost always refers to two specific classes that have their effect at similar locations.

- **Aldosterone antagonists**

Spironolactone, which is a competitive antagonist of aldosterone. Aldoterone normally adds sodium channels in the principal cells of the collecting duct and late distal tubule of the nephron. Spironolactone prevents aldosterone from entering the principal cells, preventing sodium reabsorption. Similar agent's eplerenone and potassium canreonate.

- **Epithelial sodium channel blockers**

Eg: Amiloride and triamterene.

Uses

1. To treat oedematous conditions including liver cirrhosis
2. Combined with thiazides, they can be used to treat refractory oedema.
3. In combination with thiazides or loop diuretics they are used to treat hypertension.

Adverse Effect

1. Hyperkalaemia.
2. Triamterene causes – Rise in blood urea, nausea, dizziness and muscle cramps.

Drag Interaction

1. Potassium supplements and ACE inhibitors.
2. NASIDs can decrease the effect of these agents.
3. Quinidine with amiloride may increase the risk of arrhythmias.

5. Osmotics Diuretics

Osmotic diuretics (e.g. mannitol) are substances that increase osmolality but have limited tubular epithelial cell permeability. They work primarily by expanding extracellular fluid and plasma volume, therefore increasing blood flow to the kidney, particularly the peritubular capillaries. These reduses medullary osmolality and thus impairs the concentration of urine in the loop of henle. Furthermore, the limited tubular epithelial cell permeability increases osmolality and thus water retention in the filtrate. It was previously believed that the primary mechanism of osmotic diuretics such as mannitol is that they are filtered in the glomerulus, but cannot be reabsorbed. Thus their presence leads to an increase in the osmolarity of the filtrate and to maintain osmotic balance, water is retained in the urine.

Uses

1. Barbiturate poisoning.
2. Threatened acute renal failure.
3. Cerebral edema
4. Raised intraocular pressure.[8]

Adverse Effects

1. It can cause headache, nausea, chills, polydipsia, confusion and pain in chest.

2. Exessive amount of mannitol can cause cellular dehydration; pulmonary edema in patient with CHF and hyponatremia.

Drug Interaction

1. All osmotic diuretics are not used in case of anuria and heart failure, as they may cause EC volume expansion; overload of heart, and thereby, pulmonary edema.

2. Urea is not used in hepatic cirrhosis. At high concentration, urea inhibits arginase and thereby impairs the elimination of NH_3 in urea cycle.

3. Glycerin is not used in diabetes mellitus.

4. Urea and mannitol are not used in intracranial hemorrhage.

Table. Diuretics Currently Licensed for Use in The Uk.

Sr. No.	Class of diuretics	Example
1.	Thiazide and related diuretics	Bendroflumethiazide Chlorthalidone Cyclopenthiazide Indapamide Metolazone
2.	Carbonic anhydrase inhibitors	Acetazolamide
3.	Loop diuretics	Furosemide Bumetanide Torasemide
4.	Osmotic diuretics	Mannitol
5.	Potassium-sparing diuretics	Amiloride Triamterine
6.	Potassium-sparing diuretics and aldosterone antagonists	Spironolactone Eplerenone

Natural Diuretics: In the race to find a cure for water retention, many individuals are turning to natural solutions and diuretics. Designed to release excess fluid from the body, water pills and diuretics teas can help to temporarily alleviate water retention problems.

What are Natural Diuretics?

There are huge numbers of diuretics available to treat water retention problems. Traditional western doctors will prescribe a water pill or synthetic medication to treat the problems. Many man-made substances can be rough on the body because they are not designed to work with the way that the body naturally functions. Instead, naturopaths, Chinese traditional doctors and herbalists tend to prescribe plant-based solutions. This may come in the form of pill, tincture or herbal tea. Natural diuretics are any medication or tea that is made from plant

or substance found in nature. Basically, any medication that is not man-made is normally considered natural.

How Can Natural Diuretics Help Water Retention?

Diuretics are desiged to reduce the amount of water or fluid in the body. This is done by encouraging the kidneys to send more fluid to the bladder. Ultimately, this water is released within the urine. In case of high blood pressure, a natural diuretic can remove the fluid and the pain associate with it. When the water retention caused by temporary sources like diet or premenstrual syndrome.[9]

Some of The Natural Diuretics are Given Below Which are Used in the Treatment of Various Water Retention Problems

1. Black tea: It consist of dried or fresh leaves of plant *Camellia sinensis* belonging to family Theaceae.[10] Tea has been cultivated from time immemorial in China and Japan, and more recently in Assam, Ceylon, Java, etc. The chief pharmaceutical use of tea is a source of caffeinewhich has a marked stimulant action on nervous system and heart, relaxes smooth muscle in the airways to the lungs (bronchioles), stimulates the heart, and act on the kidney as a diuretic but less powerfully so than theobromine.[11] In the preparation of black tea, four principal operation are involved: - (a) withering (b) rolling (c) fermenting (d) drying.[12] One cup of tea contains approximately 50 mg of caffeine, depending on the strength and size of cup. Caffeine only has a diuretic effect at levels higher than 400-600 mg a day. This is equivalent to six or seven cups of tea at one sitting.

Black tea has been used by Sri Lankan traditional practitioners to promote dieresis.[13] Oral diuretic activity of hot water infusion of Sri Lankan black tea is already performed in rats. This study investigates the diuretic activity of black tea infusion (BTI) in rats using Broken Orange Pekoe Fannings (BOPF) grade from major agroclimatic elevations: high-, mild-, and low-grown. Different concentrations of BTI, furosemide (positive control), and water (vehicle) were orally administered to starved (18 h) male rats (n=9/group), then hydrated. Acute and chronic (28 days) diuretic activities were assessed by measuring cumulative urine output at hourly intervals for 6h. Electrolyte levels, pH, osmolarity of urine, and glomerular filteration rate of treated rats were determined.

The result showed that the diuretic activity had a rapid onset (1^{st} h), peaked at 2^{nd} h and maintained up to 4^{th} h (except the low dose).Therefore, the Sri Lankan BOPF grade black tea

possesses mild oral diuretic activity whose efficacy differs with the agroclimatic elevation of production. Furthermore, it supports the traditional claim that the black tea acts as a diuretic.[14]

Black tea

2. Coriander: Coriander consists of dried, nearly ripe fruits of *Coriandrum sativum* Linn, belonging to family Umbelliferae.[15] Coriander is probably indigenous to the eastern Mediterranean countries where it is found a common field weed. The plant is widely cultivated in India, Egypt, Morocco, Holland, Argentina, Eastern Europe, China, Russia and Bangladesh.[16] It is a popular herb often used fresh or dried for flavor and spice in cooking. Coriander has a lemony and nutty flavor. Its seeds can be crushed or sauteed whole for use in dishes like Thai curries. Alternatively, its leaves can be tossed in cooked dishes such as rice. One study looked at the use of coriander seeds as a diuretic. After infusing the liquid coriander extract (through the veins of rats), the researchers found that the mechanism of the plant is similar to that of medications like Furosemide. A similar study using the extract found diuretic properties as well as lowered blood pressure in various animals.

Medicinal properties as mentioned in ancient literature

"धान्यकं तुवरं स्निग्धमवृष्यं मूत्रळं लघु ।
तिक्तं कटूष्णवीर्यं च दीपनं पाचनं स्मृतम् ।।
ज्वरघ्नं रोचनं ग्राहि स्वादुषाकि त्रिदोषनुत् ।
तृष्णादाहवमिश्वासकासामार्शःकृमिप्रणुत् ।।
आर्द्रन्तु तद्गुणं स्वादु विशेषात्पित्तनाशि तत् ।" (भा.प्र.)

Which says that, "The fruits are aromatic, bitter, sweet, acrid, astringent, emollient, thermogenic, anti-inflammatory, anthelmintic, stomachic, carminative, digestive, appetizer, constipating, diuretic, antipyretic, stimulant, expectorant and anodyne.[17]

Coriander

3. Fennel: Fennel is an herb that originated in the mediterranean and grows wild in part of Europe and India. Fennel is obtained from the plant *Foeniculum vulgare* belonging to the family Apiaceae. Its bulb, seeds and greens are edible, and the roots and seeds may have diuretic properties. Fennel offers an anise or licorice flavor and is often roasted and used in pasta dishes, soups or for baking bread.

A 2014 study showed a significant diuretic effect in mice from liquid fennel extract at dose of 500 mg per kilogram. The urine elimination was double that of the control group.

Medicinal properties as mentioned in ancient literature

"मिश्रेया तद्गुणा प्रेक्ता विशेषाद् योनिशूलनुत् ।
अग्निमान्द्यहरी हृद्या बद्धविट् कृमिशुक्ळहृत् ॥
रूक्षोष्णा पाचनी कासवमिश्ळेष्मानिलान् हरेत् ।" (भा.प्र.)

Which says that, "The fruits are sweet, acrid, bitter, emollient, refrigerent, alexipharmic, expectorant, haematinic, opthalmic, intellect-promoting, anthelmintic, carminative, digestive, stomachic, stimulant, diuretic and tonic.[18]

Fennel

4. Dandelion: Dandelion leaves have been used in traditional medicine around the world from the plant *Taraxacum officinale* belonging to family Asteraceae. Its leaves, roots and flower are considered safe to eat and are high in potassium. The taste of dandelion is earthy and bitter. Its greens can be sauteed like kale, tossed in salad or cooked and added to a soup or herbal tea. Additionally, the extract, taken from the leaf, can be consumed as a capsule or in liquid form. One study of 28 women found a significant increase in urine after drinking 8 ml of liquid leaf extract.

Result found that it acted as a quick and useful natural diuretic.

Medicinal properties as mentioned in ancient literature

रक्तशुद्धिकरं प्रोक्तं विषव्रणहरं परम् ।
अग्निमान्द्यमजीर्णं च गुल्मशूलज्वरकृमीन् ॥
त्वग्दोषविषवीसर्पकुष्ठकृच्छ्रक्षयापहम् ।
कामिलापाण्डुहृद्रोगपित्तोन्मादविनाशनम् ॥" (स्व.)

Which says that, "The dandelion is bitter, acrid, thermogenic, vulnerary, digestive, diuretic, anthelmintic, liver tonic, febrifuge, antibacterial, anti-inflammatory, stimulant and tonic.[19]

Dandelion flower

5. Radish

It consists of dried seeds and leaves of *Raphanus sativus* belonging to family Cruciferae. It is cultivated in many temperate and warmer countries, cultivated all over India upto 5000 m of height. It is commonly known as Muli. Leaves, roots and seeds are used for medicinal purposes.

Medicinal properties as mentioned in ancient literature

"लघु मूलं कटूष्णां स्याद्रुच्यं लघु च पाचनम्।
दोषत्रपहरं स्वर्य्यं ज्वरश्वासाविनाशनम्।।
नासिकाकण्ठ रोगध्नं नयनामयनाशनाम्।" **(Bhâ. Pra.)**

Which says that, "Radish is pungent, hot in potency, helps in taste, is digestive, mitigates all three doshes, good for voice, cures fever, dyspnoea, diseases of throat and eyes. Seeds and leaves are diuretic, laxative and lithnotriptic; seeds are also believed to posses emmenagogue properties. Juice of fresh roots is considered to be powerfully antiscorbutic."

***Raphanus Sativus* linn (Muli)**

6. Melon: It consists of dried fruits of *Cucumis melo* belonging to family Cucurbitaceae. It is commonly known as Kharbuja. Roots pulp and seeds are used for medicinal purposes.

Medicinal properties as mentioned in ancient literature

रवरबूजं मूत्रलं वल्यं कोष्ठ शुद्धि करं गुरु।
स्निग्धं स्वादुतरं शीतं वृष्यं पित्तानिलपहम्।
रक्तपित्त करं तन्तु मूत्र कृच्छ करं परम्"।। **(Bhâ. Pra.)**

Which says that, "Melon is diuretic, hard for for digestion, unctuous, very sweet, cold in potency, aphrodisiac, mitigates pitta and vata, produces bleeding disease and dysurea especially. Fruits juice and pulp are cooling, nutritive, demulcent and diuretic. Root is purgative."

***Cucumis melo* linn whole plant**

7. Italian millet: It consists of dried stalk and grains of *Setania italica* belonging to family Poaceae. It is a minor grain crop, widely cultivated throughout India, especial in Maharashtra and Gujarat. It is commonly known as Kanguni. Stalks and grains are used for medicinal purposes.

The medicinal properties as mentioned in ancient literature:

"कङ्गस्तु यग्नसन्धानवातकृद् बृहणी गुरु

रुक्षा श्लेष्ममहराऽतीव वाजिनां गुणकृद् भङ्कशम्"।। **(Bhâ. Pra.)**

Which says that, "Italian millet unites the broken tones, aggravates vata, stoutens the body, is hard to digest, causes dryness and mitigates kapha greatly; is diuretic and astringent".[20]

Italian millet

8. Horse gram

It consists of dried seeds of *Dolichos biflorus*, an annual, branched, sub-erect or twining herb, belonging to family Leguminosae. It is found all over India, and popularly known as Kulti, propagated by seeds and vegetative method. Seeds are used for medicinal purposes.

The medicinal properties as mentioned in ancient literature

"कंदकलत्थः कटुकः पाके कषायः पित्तरक्तकृत्।
लघुर्विदाही वीर्योष्णः श्रासकासकफानिलान्।।
हन्ति हिक्काश्भरीशुंक्रदाहानाहान् सपीनसान्।
स्वेदसंग्राहको मेदोज्वरक्रिमिहरः सरः"।। **(Bhâ. Pra.)**

Which says that, " horse gram is pungent after digestion, astringent, diuretic, tonic produces disorder of pitta and rakta, hot in potency, mitigates dyspnoea, cough, disorder of kapha, vata, renal calculi, seminal stones, flatulence, rhinitis, cause perspiration, reduce fat, cures fever".

Horse gram seeds

Dosage Form: It is one of the ingredients of the preparation known as Neeri syrup (Aimil Pharmaceuticals).[21]

Oral dosage form of Horse gram

CONCLUSION

The above information is an attempt to provide an overview of the current knowledge surrounding the use of herbal medicines as diuretics. In modern day to day practice diuretics

can be used as a first line therapy in hypertensive patients. Herbal medicines are in great demand in the developed as well as in the developing countries for primary health care because of their wide biological and medicinal activities, higher safety margins and lesser costs.

The information has included the botanical characteristics of the plant which helps in identification of the plant, Ethnobotany which give traditional use of the plant, and the reported activities of the plant. Synthetic diuretics used in allopathic treatment of medicines are a part of many kidney diseases, hypertension and other related diseases but they were severe side effects and contraindication regarding the use of these drugs. Nowadays world is getting attention for natural remedies. Natural herbs are helpful in the development of future medicines and treatments. The therapeutic effects of these natural remedies may be less pronounced at times than synthetic drugs, but the probability of adverse symptoms to minimum. By this information, it can be concluded that in the core of the nature there are so many plants which possess potent diuretic activity. Herbal medications are free from side effects and toxicity unlike the synthetic ones. So theses natural actives can be easily and safely replaced as diuretics as a part of treatment.

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