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Effective Medicinal Plants' Extract on Ability to Properly Empty Bladder in Patients with Benign Prostatic Hyperplasia and *Escherichia coli* Infection

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Abstract: Background: Benign Prostatic Hyperplasia (BPH) can increase the risk of urinary tract infections. Urinary tract infections in men include infection with *Escherichia coli*. In Nigeria, West Africa, medicinal plants are sometimes used to relieve BPH with the aim to avoiding transurethral resection of the prostate (surgery). **Investigation:** 200g each of *Cola acuminata* fruits and *Capsicum annuum* var *fasciculatum* fruits with 400g of *Zingiber officinale* rhizomes were ground. 1L of *Citrus aurantium* fruit juice was added. The extract was left overnight for 72 hr. The extract was filtered and concentrated to about one-sixth of its original volume in *vacuo* using a rotary evaporator (Quick fit, Rotavapor-R, Buchi, Switzerland) at 30^{o}C under low vacuum pressure and low evaporation. 100ml of the concentrated extract was given orally to ten male human subjects diagnosed with benign prostatic hyperplasia and *Escherichia coli* infection with inability to empty their bladders by proper urination. The ten subjects were diagnosed positive for benign prostatic hyperplasia at the Medical Out-Patient (MOP) Unit of the University College Hospital, Ibadan, Nigeria and positive for *Escherichia coli* infection at the Department of Medical Microbiology and Parasitology, University College Hospital, Ibadan, Nigeria. Oral application of extract to subjects was immediately after meal on a daily basis for a period of ten days. **Observation:** All subjects were able to empty bladder by proper urination conveniently within eight days of oral application of extract. **Conclusion:** The concentrated extract of a combination of *Cola acuminata* fruits, *Capsicum annuum* var *fasciculatum* fruits, *Zingiber officinale* rhizomes and *Citrus aurantium* fruit juice was effective on the ability to empty bladder by proper urination in patients with benign prostatic hyperplasia and *Escherichia coli* infection.
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Keywords: Benign Prostatic Hyperplasia (BPH); *Escherichia coli*; Medicinal Plants

1. Introduction

Prostate enlargement or Benign Prostatic Hyperplasia (BPH) causes the inability to properly empty the bladder [1]. It can increase the risk of infection in the urinary tract [1]. Gram negative enteric bacteria such as *Escherichia coli*, *Pseudomonas aeruginosa* and *Enterococcus* are associated with urinary tract infections that may cause chronic bacterial prostatis [2]. In Nigeria, West Africa, medicinal plants are sometimes used to relieve symptoms of BPH with the aim to avoiding transurethral resection of the prostate (surgery).

In this investigation, a concentrated extract of a combination of *Cola acuminata* fruits, *Capsicum annuum* var *fasciculatum* fruits, *Zingiber officinale* rhizomes and *Citrus aurantium* fruits was given orally to ten male patients diagnosed with benign prostatic hyperplasia and *Escherichia coli* infection with the view to determining its anti-benign prostatic hyperplasia effects.

2. Materials and Methods

Identification of Plant Samples

Cola acuminata fruits, *Capsicum annuum* var *fasciculatum* fruits, *Zingiber officinale* rhizomes and *Citrus aurantium* fruits were bought from Oje Market, Ibadan, Nigeria. They were identified in the Herbarium of the Department of Botany, University of Ibadan, Ibadan, Nigeria by Professor Taiye R. Fasola of the same department. The fruits and rhizomes were kept in cellophane bags at room temperature prior to start of analysis.

Preparation of Extract

200g each of *Cola acuminata* fruits and *Capsicum annuum* var *fasciculatum* fruits with 400g of *Zingiber officinale* rhizomes were ground. 1L of *Citrus aurantium* fruit juice was added. The extract was left overnight for 72 hr. The extract was filtered and concentrated to about one-sixth of its original volume in *vacuo* using a rotary evaporator (Quick fit, Rotavapor-R, Buchi, Switzerland) at 30^{o}C under low vacuum pressure and low evaporation [3].

Study Population

The study population spanned thirty adult male individuals within the age range of 60 years – 75 years within Ibadan metropolis, Ibadan, Nigeria diagnosed with Benign Prostatic Hyperplasia (BPH) at the Medical Out-Patient Unit of the University College Hospital, Ibadan, Nigeria. Of these, ten patients also diagnosed with Urinary Tract Infection (UTI) at the Department of Medical Microbiology and Parasitology, University College Hospital, Ibadan, Nigeria were selected for the investigation. The subjects were unable to empty their bladders by proper urination.

Oral Application of Extract

Ten (10) adult male human subjects diagnosed with both benign prostatic hyperplasia and *Escherichia coli* infection with inability to empty their bladders by proper urination participated in this research investigation. Their consent to participate in the investigation was obtained after ethical approval from the University College Hospital Research Committee. 100ml of the concentrated extract was given orally to the ten subjects. Oral application of extract to subjects was immediately after meal on a daily basis for a period of ten days.

3. Results

All the human subjects with benign prostatic hyperplasia and *Escherichia coli* infection were conveniently able to empty their bladders by proper urination within eight days of the oral application of the plants' extract.

4. Discussion

Men with enlarged prostate need surgery to relieve urinary retention [4]. The inability to fully empty the bladder can increase the risk of infection in the urinary tract [4]. Some Gram negative bacteria like *Escherichia coli*, *Pseudomonas aeruginosa* and *Enterococcus* are associated with urinary tract infections that may cause chronic bacterial prostatis [5]. In Nigeria, India and China, medicinal plants are used as an alternative to much more refined orthodox medicine with the aim to curing several ailments in the advent of a new frontier [6].

It was observed in this research investigation that the concentrated extract of a combination of *Cola acuminata* fruits, *Capsicum annuum* var *fasciculatum* fruits, *Zingiber officinale* rhizomes and *Citrus aurantium* fruit juice was effective on the ability to empty bladder by proper urination in patients with benign prostatic hyperplasia and *Escherichia coli* infection caused by urine retention in the bladder. The need for further investigations.

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