Effects of Methanolic Extracts of Trichosanthes Cucumerina Seeds on the Weight of Urinary Bladder in Adult Male Wistar Rats

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Abstract

Background: To determine the effect caused by the methanolic extract of Trichosanthes cucumerina seeds on the weight of adult male Wistar rats’ urinary bladder.

Place and Duration of Study:
Department of Anatomy, Faculty of Basic Medical Science, Olabisi Onabanjo University, Ikenne, Ogun State Nigeria, for 4 weeks.

Methodology:
We included 15 adult male Wistar rats, of 3 groups (Normal control NCTRL, High dose of extract HDT/C, Low dose of extract LDT/C) with each group comprising of 5 animals each weighing between 150g-320g. The animals were administered with the methanolic extract of the plant’s seed, grouped in HD/TC and LDT/C with respect to their body weight for a period of 3 weeks. After which, the animals were sacrificed and the urinary bladders removed and weighed. All results were expressed as Mean ± Standard Deviation (S.D) for each group. All grouped data were statistically evaluated using SPSS 15.0 software. Hypothesis testing methods included the independent – samples t-test. Statistical significance was set at p<0.05.

Result:
The methanolic extract of Trichosanthes cucumerina seed was observed not to be of any significant effect on the urinary bladder.

Conclusion:
It can be concluded from the result of this work that both high and low dose of the methanolic extract of Trichosanthes cucumerina seed did not have a significant effect on the weight of the urinary bladder. Therefore one can conclude that administration of Trichosanthes cucumerina seed used for the treatment of inflammation may not cause any histological aberration in the urinary bladder.

Introduction

The urinary bladder is the organ that collects urine excreted by the kidneys before disposal by urination. A hollow [1] muscular, and distensible organ, the bladder sits on the pelvic floor. Urine enters the bladder via the ureters and exits via the urethra. Bladders occur throughout much of the animal kingdom, but are very diverse in form and in some cases are not homologous with the urinary bladder in humans. The human urinary bladder is derived in embryo from the urogenital sinus and, it is initially continuous with the allantois. In males, the base of the bladder lies between the rectum and the pubic symphysis. It is superior to the prostate, and separated from the rectum by the rectovesical excavation. In females, the bladder sits inferior to the uterus and anterior to the vagina; thus, its maximum capacity is lower than in males. It is separated from the uterus by the vesicouterine excavation. In infants and young children, the urinary bladder is in the abdomen even when empty.[2] The detrusor muscle is a layer of the urinary bladder wall made of smooth muscle fibers arranged in spiral, longitudinal, and circular bundles. When the bladder is stretched, this signals the parasympathetic nervous system to contract the detrusor muscle. This encourages the bladder to expel urine through the urethra. For the urine to exit the bladder, both the autonomically controlled internal sphincter and the voluntarily controlled external sphincter must be opened. Problems with these muscles can lead to incontinence. The urinary bladder usually holds 300-350 ml of urine. As urine accumulates, the rugae flatten and the wall of the bladder thins as it stretches, allowing the bladder to store larger amounts of urine without a significant rise in internal pressure.[3] The urinary bladder has a transitional epithelium and so, it does not produce mucus.[4] The fundus of the urinary bladder is the base of the bladder, formed by the posterior wall. It is lymphatically drained by the external iliac lymph nodes. The peritoneum lies superior to the fundus. The bladder receives motor innervation from both sympathetic fibers, most of which arise from the hypogastric plexuses and nerves, and...
parasympathetic fibers, which come from the pelvic splanchnic nerves and the inferior hypogastric plexus.[5] Sensation from the bladder is transmitted to the central nervous system (CNS) via general visceral afferent fibers (GVA). GVA fibers on the superior surface follow the course of the sympathetic efferent nerves back to the CNS, while GVA fibers on the inferior portion of the bladder follow the course of the parasympathetic efferents. [5] Snake gourd (Trichosanthes cucumerina) belongs to the family Cucurbitaceae mostly consumed as vegetable, but it may grow throughout the year except extreme winter. It is a popular vegetable with moderately high nutritive value. The total production of snake gourd during 2003-2004 was 136,000 tons on the area of 1,59,000 acres of land. [6] This figure indicates the low yield potentiality of our cultivars. It is commonly called as snake gourd, viper gourd, snake tomato or long tomato. The fruit is usually consumed as a vegetable due to its good nutritional value. The plant is richly constituted with a series of chemical constituents like flavonoids, carotenoids, phenolic acids which makes the plant pharmacologically and therapeutically active. Its Fruit is regarded as anthelmintic, vomitive [7] antidia-betic [8] for boil 19]. Seeds are anthelmintic, and anti fibrile [10]. Root is used as purgative and tonic. The pharmacological activities of cucurbitacin containing plants have been known since ancient times. Cucurbitacins are particularly known in folk medicine for their strong purgative, anti-inflammatory, and hepatoprotective activities [11].

**Methods**

**Management:**
15 Adult Wistar rats were obtained from the animal house of the Department of Zoology, University of Ibadan, Nigeria. They were housed in the animal house provided by the Department of Anatomy, Olabisi Onabanjo University, where they had access to food, water, and air. Their environment was well cleaned to avoid infection of any kind upon the animals. After a week of acclimatization, the animals were divided into three groups; two treatments and one control. In the treatment groups there were 5 rats each while the control group was assigned 5 rats. The rats weighed between 150g-320g with ages ranging from 10-12 weeks. They were housed in individual cages in a room with ambient temperature. The rats were fed during the experimental procedure with standard pellet diet. The weights of the rats were taken daily.

**Drug Administration:**
Methanolic extracts of Trichosanthes cucumerina was administered orally at a high dose of 0.2mg/ml body weight and low dose of 0.1mg/ml orrespectively for the treated groups, once daily for 3 weeks.[12] The control group received an equivalent volume of 0.5ml of normal saline.

**Processing:**
The animals were sacrificed with the abdominal cavity of each rat opened and the urinary bladder taken out. The urinary bladders were then weighed using a sensitive balance.

**Discussion**

It could be observed from the result obtained in this study that a high dose of 0.2mg/ml and 0.1mg/ml of high and low dosages body respectively did not lead any significant increment in the urinary bladder weight when administered daily for 3 weeks. The high doses were designed to represent human exposure to high levels of Trichosanthes cucumerina while the low dose was to represent exposure to low levels of Trichosanthes cucumerina. This data also collaborated with physical observation. The results showed that methanolic extract of Trichosanthes cucumerina using t-test at 5% level of significance showed no significant difference (P < 0.05) was observed statistically between the groups (N ctrl and LD T/C). In addition, no significance difference (P < 0.05) was observed statistically between the groups (N ctrl and HD T/C). One will observe from the table that the extracts caused no significant effect on the bladders’ weights.

**Conclusion(s)**

It can be concluded from the result of this work that both high and low dose of the methanolic extract of Trichosanthes cucumerina seed did not have a significant effect on the weight of the urinary bladder. Therefore one can conclude that administration of Trichosanthes cucumerina used for the treatment of inflammation may not cause any histological aberration in the urinary bladder.

**References**

1. Howard A. Werman, Keith J. Karren.
Wilkins.


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Abbreviations

T/C- Trichosanthes cucumerina
METC- Methanolic extract of Trichosantes cucumurina seed
MEAN ± SD- Mean plus OR minus Standard Deviation

p<0.05- Statistical significance was set at p< 0.05.
t-test- samples t-test
Illustrations

Illustration 1

Results

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>Number of Rats</th>
<th>MEAN ± S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Control (N CTRL)</td>
<td>5</td>
<td>0.05 ± 0.01</td>
</tr>
<tr>
<td>High Dose of Plant Extract (HD T/C)</td>
<td>5</td>
<td>0.04 ± 0.01</td>
</tr>
<tr>
<td>Low Dose of Plant Extract (LD T/C)</td>
<td>5</td>
<td>0.05 ± 0.01</td>
</tr>
</tbody>
</table>

The means of the groups were compared using t-test at p < 0.05.
c- No significant difference between N CTRL when compared with HD T/C & LD T/C
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