Research Article

Effect of Black Tea on Diarrhoea – A Research

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ABSTRACT

Enterotoxigenic Escherichia Coli (ETEC) infection is a major cause of dehydrating diarrhoea in infants and old age people in sub-hygienic conditions. We studied the effect of black tea on the intestinal fluid and electrolyte losses involved in ETEC diarrhoea. The aim of the study was to assess the inhibitory capacity of black tea and subfractions towards ETEC –induced secretory diarrhoea. The anti-secretory property of black tea on enterotoxigenic *E.Coli* was monitored.

Keywords: Tannins, enteropathogens, enzymatic oxidation, intestinal lumen, enterotoxin, Cholera toxin, gastrointestinal infections.

INTRODUCTION

Diarrhoea usually occurs when fluid can't be absorbed from the contents of your bowel, or when extra fluid is secreted into your bowel, causing watery stool. (1)

Diarrhoea is usually a symptom of a bowel infection (gastroenteritis), which can be caused by:

- **a virus** – such as norovirus or rotavirus
- **bacteria** – such as campylobacter, Clostridium difficile (C. difficile), Escherichia coli (E. coli), salmonella or shigella; these can all cause food poisoning
- **parasites** – such as the Giardia intestinalis parasite that causes giardiasis.[2]

Among children younger than than 5 years and old age people in developing countries, gastrointestinal infections with enterotoxigenic Escherichia (ETEC) pose a major abdominal health problem[3]. In community-based studies of children, ETEC is the most frequently isolated entero pathogen, accounting for approximately 200 million diarrhoea episodes and approximately 390,000 deaths annually.[4] enterotoxigenic E.coli (ETEC) diarrhoea has been associated with subsequent growth flattering. Entero toxignic E.coli is the leading cause for travellers' diarrhoea.[5] Chewing black tea leaves is a common "folk remedy" in different countries suggested to be effective In ceasing diarrhoea.[6] Tea is characterised by a high content of polyphenols called flavonoids and tannins.[7] Black tea contains mainly dimeric and polymeric tannins, which are formed upon leaf damage and enzymatic oxidation of the monomeric and dimeric tannins.[10]

Enterotoxigenic E. coli secretes at least 1 of 2 types of enterotoxins, known as heat-labile (LT) and heat-stable enterotoxins a and b. The LT is structurally and biologically related to Vibrio cholerae-secreted enterotoxin.[9] These enterotoxins share a similar toxic mechanism by binding to the small intestinal epithelium and subsequently activating cyclic nucleotide second messenger systems that initiate metabolic cascades characterized by net fluid and electrolyte secretions into the intestinal lumen; epithelial Cl^- secretion is activated, and NaCl and K^+ absorption are inhibited.[6] Cholera toxin and LT stimulate the intracellular synthesis of cyclic adenosine monophosphate (cAMP), whereas ETEC heat-stable entero toxin a increases cyclic guanosine monophosphate.[14] When the dehydration resulting from massive electrolyte and fluid losses is severe, the diarrhoea can be life threatening if not treated adequately.[11]

MATERIALS AND METHODS

The black tea powder (Lipton) was commercially bought. A total of 30 patients suffering from diarrhoea were chosen. They were infants of age group 2-8 and adults of age group 38-60. They were asked to drink two spoons of black tea in the empty stomach by boiling the black tea powder in water with a small quantity of sugar for sweetening.

Inclusion criteria

1. People who had severe or mild diarrhoea.

2. Peoplebelonging to 2-8 yrs and 38-60 yrs.

Exclusion criteria

1. People who take in Ayurvedic treatment

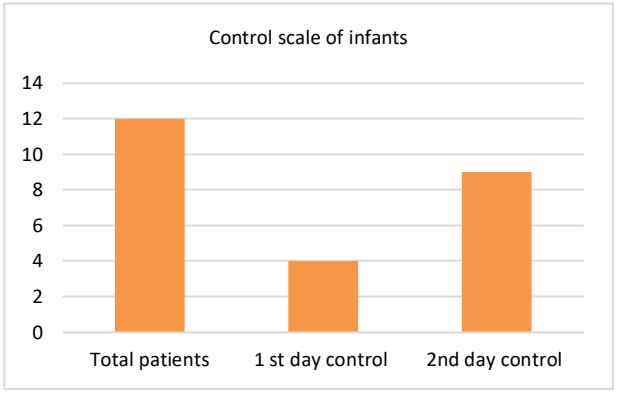
Patients control scale for the first day and the second day was noted. Patient control scale in this study was whether they had control or not. The result of the study was tabulated. Accordingly a graph was also drawn.

RESULTS

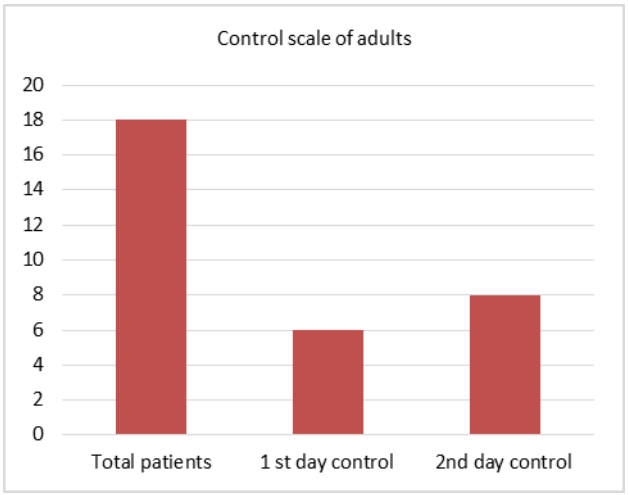
The effect of black tea on diarrhoea was noted after 2 days of intake. The control reaction has increased

gradually. The black tea had immediate effect on diarrhoea. In a total of 30 patients, 12 of them had on the first day and 25 of them had control on the second day. The graph 1 and 2 below shows the control of diarrhoea after the intake of black tea.

Graph 1



Graph 2



DISCUSSION

The patients had very good control within two days. Out of 12 infants,4 of them showed control on the first day and 9 of them had control on the second day. In yang's study the polyphenols of black tea had reaction over diarrhoea,in a total of 120 patients,96 of them control on the second day.[1] In Kohlmeier's study the gallate had good effector diarrhoea,in a total of 98 patients 73 had control.[2] In Stephan's study catechins of black teahad reaction over. diarrhoea, in a total of 160 patients, 122 had control.In Morphe's study the participants had good effect on black tea rather than green tea.[3] In stoner's study the flavonoids in black tea had control over diarrhoea.[4] In Shelly's study tannins of black tea had a good effect on diarrhoea,in a total of 135 patients 102 of them had control. In ulter's study the effect of catechins in black tea on diarrhoea was shown.[5] In mullie's tflavins present in black tea had control over gastrointestinal problems.[8] In Fukushima's studypoliovirus-specific intestinal antibody response of *Bifidobacterium breve* was shown.[10] Haller's studyshows the activation of Catechin's in the intestine.[13] Hessle's study showed that Lactobacilli from human gastrointestinal mucosa are strong stimulators. Schiffrin's study shows Polyphenols of black tea as inhibitors of carcinogenesis.[15] In kalliomaki's study, flavonoids in black tea had a good effect on cancer cells.[7]

CONCLUSION

Given the tendency of people towards traditional medicine and using, the findings of this study indicate that the use of the black tea along with conventional drugs seems to be an effective, inexpensive and safe treatment for non-acute diarrhoea management. Further studies are needed to generalise these results.[12]

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