

CONSUMPTION OF RED-HOT CHILI PEPPER INCREASES SYMPTOMS IN PATIENTS WITH ACUTE ANAL FISSURES.

A prospective, randomized, placebo-controlled, double blind, crossover trial

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ABSTRACT – *Background* - Red-hot chili pepper and other spices have been blamed for causing or exacerbating symptoms of anal pathologies like anal fissure and hemorrhoids. *Aim* - To determine if consumption of chilies increases symptoms of acute anal fissures. *Methods* - Individual patients were randomized to receive capsules containing chili or placebo for one week in addition to analgesics and fiber supplement. Patients were asked to note score for symptoms like pain, anal burning, and pruritus during the study period. After 1 week, cross over treatment was administered to the same group of patients with the same methodology and results were noted at the end of 2 weeks. *Results* - Fifty subjects were recruited for this study. Forty three of them completed the trial (22 in the chili group and 21 in the placebo group). The daily mean pain score was significantly lower in the placebo group in the study period. Score 2.05 in chili group and 0.97 in placebo group. There was a significant burning sensation experienced by the patients in the chili group (score 1.85 for the chili group vs 0.71 for the placebo group). Patient's mean recorded improvement score was significantly higher after taking placebo. Eighty one point three percent patients preferred placebo while 13.9% preferred chilies. Two patients had no preference. *Conclusion* - Consumption of chili does increase the symptoms of acute anal fissure and reduces patient compliance.

HEADINGS – Fissure in ano. Pimenta. Capsaicin. Spices.

INTRODUCTION

Spicy foods are routinely consumed by a large part of the world population, particularly in Asia, Mexico and South Italy. In United States, pepper is a basic ingredient in Creole, Cajun and Mexican-American cuisine. An Indian cuisine is also rich in chili pepper⁽¹²⁾ (*Capsicum annuum*) because of its pungent effect.

Chili rich foods have often been blamed for deleterious effects on the onset and deterioration of anal pathologies like the anal fissures and hemorrhoidal disease⁽¹¹⁾ and for this reason, they are usually forbidden by general practitioners and coloproctologists to their patients afflicted by these ailments.

The medical literature however, is silent on information about such effects and therefore this presumption seems to be based on empirical culture and traditional bases rather than scientific evidences⁽⁹⁾.

Sun dried chilies which are believed to be gastric stimulant, contains capsaicin and dihydrocapsaicin having nitrophenols in them which produce nitrosation of foodstuff, results in causing toxicity in the gastrointestinal tract⁽²³⁾. Capsaicin is known to affect

visceral sensory perception and chilies have been shown to accelerate gut transit, increasing the bowel frequency⁽³⁾.

In an experimental study, it was found that consumption of red chilies produced exfoliation of intestinal epithelium in the lumen in rats⁽⁵⁾. Chilies have also been considered as an ulcerogenic food substance⁽²¹⁾.

Such varied opinions and beliefs led us to set a trial to evaluate any cause-effect relationship between the consumption/ingestion of dried chilies and its effects on the symptoms of acute anal fissure.

Anal fissure is the most common cause of severe anal pain. The pain induced by anal fissure is intolerable and usually is disproportionate to the severity of physical lesion. It has been established that healing of an acute anal fissure could be achieved with conservative therapies like warm water sitz bath, analgesics, and stool softeners. We advocated these measures to our study population suffering from acute anal fissure along with consumption of chilies.

The aim of this study was to evaluate the role of dried chili ingestion in patients with acute anal fissures when compared with placebo.

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METHODS

The study was a randomized and controlled clinical trial. It was approved by Fine Morning Hospital and Research Center (Nagpur, India) Ethical Committee, and was performed in accordance with the Declaration of Helsinki.

Hypothesis

The study was a trial to subject the hypothesis to test that consumption of chili has adverse effects on the symptoms of acute anal fissure.

Protocol

A sample size calculation estimated that a minimum of 20 patients would be needed in each group to demonstrate an increase in anal fissure symptoms at the 5 percent level of significance with a power of 90 percent. To prevent losses during follow-up, it was ensured that at least 25 patients were included in each arm. All the patients between 18 and 60 years of age presenting with anal fissure of less than 1 month duration with voluntary, informed consent to participate in the study were considered for inclusion in the trial. The diagnosis of anal fissure was made if the patient presented with painful defecation with or without rectal bleeding and visible anal fissure. Patients were excluded if there was a history of recurrent fissure, presence of chronicity of anal fissures (sentinel tag, visible fibers of internal sphincter, suppuration etc.). Similarly pregnant females, patients operated for any anorectal pathology in the past and patients having gastric or abdominal symptoms were also excluded. Further exclusion criteria were an inability to understand the end points of the study and to complete the forms for data recording.

The study was conducted by following a randomized, control design. The study population was then randomly assigned by computer-based sequential method to analgesic plus fiber supplement plus placebo (control patients, n = 25) or identical analgesic plus fiber supplement plus chilies (chili patients, n = 25).

Assignment and treatment

After analyzing cookery books from 5 different expert cooks and the medical literature⁽¹²⁾, it was estimated that about 1.5 grams of dried chili powder is required to add to a normal dish to make it spicy enough. So this amount of chili was confectioned in a capsule. The capsules were prepared by an independent pharmacy not attached with the hospital. Capsules were numbered consecutively, but the sequence of placebo and chili powder was randomized. The chili powder was obtained through a commercially available pack of chili powder approved by the Food and Drug Administration in India and containing ground sun-dried red chilies.

The active capsule contained 1.5 grams of chili powder and 0.5 grams lactose free microcrystalline cellulose. Placebo capsules contained 2 grams of microcrystalline cellulose alone. Both the capsules were colored black to prevent identification of the contents.

All the patients received 10 grams of psyllium husk (Fybogel) at bedtime for the 2 weeks period of study. Patients were supplied with tablets containing Diclofenac Sodium 50 mg, to be taken

as needed but not more than 2 tablets per day. Patients were advised to eat fiber-rich food. During the study period, patients were instructed to avoid any other food potentially related to gastrointestinal and hemorrhoidal symptoms such as spices, alcohol, tobacco, tea and coffee.

Each patient was given a pack containing 28 capsules (containing 14 placebo and 14 chili powder capsules numbered consecutively) to be taken after lunch and dinner every day. The patients were asked to take 14 capsules (each two capsules numbered serially like 1-A to 7-A) sequentially in the first week and to note down these code numbers. After one week they repeated the treatment taking capsules numbered 8-A to 14-A. The next patient received capsules numbered 15-A to 28-A and so on. However, the patients and the doctors associated with this study were unaware of the capsule code and its contents.

Patients were asked to self-assess specific symptoms, which included post defecation pain, anal burning (described as burning sensation in the anus), and pruritus before the beginning of the treatment and after one and two weeks of treatment. Each symptom was allocated a score from 0 to 3 (0 = no symptoms, 1 = mild, 2 = moderate, 3 = severe intensity). Patients were also asked to note the amount of analgesic tablets consumed in two weeks. The patients also recorded the food they have eaten each day and enter the details of the food in a diary (food diary). During the follow-up, the observer assessed that patients have used the foodstuffs, which did not contained chilies in any form.

Patients also recorded improvement score (0-10 on a visual analogue scale where 0 indicates no relief at all and 10 indicates an excellent result) at the end of each week and final preference for the type of treatment was also documented.

Monitoring

Patients were called after 1 week in the office and were interviewed by an independent observer, who ensured that the capsule were being taken correctly and sequentially and performed assessment of patient's symptoms. Thereafter the patients crossed over to the other treatment and they were re-evaluated at the end of 2nd week in the similar manner.

Main outcome measures were post defecation pain, anal burning and pruritus. Secondary outcome measures were number of analgesic tablets consumed, improvement score and preference for the type of treatment.

Statistical analysis

Data on patient demographics and various outcome measures were entered into a statistical software package and analyzed using Wilcoxon's signed-ranks test for continuous variables and the chi-squared test or Fisher's exact test for categorical variables. Statistical significance was fixed at the 5% level.

RESULTS

Fifty patients (23 women and 27 men) with an average age of 27 (range, 18-42) years were recruited from March to July 2006 from the outpatient clinic of Fine Morning Hospital and Research Center.

Demographics and clinical presentation characteristics

There were no differences in mean age ($P = 0.14$), male:female ratio ($P = 0.35$), or duration of symptoms between chili and control groups ($P = 0.55$) (Table 1).

TABLE 1. Characteristics of study population

	Placebo group (n = 21)	Chili group (n = 22)
Median age in year (range)	30 (19-42)	28(18-39)
Female to male ratio	9/12	11/11
Mean duration of symptoms in days (range)	10 (5-21)	8 (4-20)

Participant flow

Fifty subjects were recruited for the trial. Four patients dropped out from the study in the first week. Another three patients did not report back at the end of 2 week and were excluded from the trial. All in all, 43 patients completed the trial, 22 in the chili group and 21 in the control (placebo) group.

Analysis

Pain - the daily mean pain score was significantly lower in the placebo group in the study period (score 2.05 in chili group and 0.97 in control group, $P < 0.001$).

As regard mean analgesic requirement in study period of 14 days, patients used an average of 18 tablets (range 11-24) in the placebo group compared with 25 tablets (range 15-30 tablets) in the chili group.

Anal burning - there was a significant burning sensation experienced by the patients in the chili group (score 1.85 for the chili group vs. 0.71 for the control group, $P < 0.001$).

The mean score for pruritus was higher in the chili group when compared with the control group; however, it did not reach to statistically significant level (0.45 in the control group and 0.75 in chili group, $P < 0.69$).

Patient's mean recorded improvement score was significantly higher after taking placebo (6.4) than after chili (3.7, $P < 0.001$). Of the 43 patients who completed the trial protocol, 35 (81.3%) preferred placebo to chilies, while 6 preferred chilies (13.9%). Two patients had no preference (Table 2).

TABLE 2. Effect of chili and placebo on pain, anal burning, anal pruritus and patient's recorded improvement score, compared to pretreatment values. Results are shown as mean (95% confidence interval)

	Before treatment (n = 43)	Placebo (n = 43)	Chili (n = 43)	P-value
Pain [†]	2.45	0.97	2.05	0.001*
Anal burning [†]	2.22	0.71	1.85	0.001*
Pruritus [†]	0.76	0.45	0.75	0.69
Improvement score [‡]		6.4	7.3	0.001*

* Statistically significant. Wilcoxon's signed-ranks test

[†] Score from 0 to 3 (0= no symptoms, 1= mild, 2= moderate, 3= severe intensity)

[‡] 0-10 on visual analogue scale where 0 indicates no improvement and 10 indicates an excellent result

DISCUSSION

Even though no scientific evidence is available to indicate that consumption of chili increases symptoms of anal fissure, it

is probably frequently forbidden because of the hypothesis that chilies are generally harmful to patients with duodenal ulcer⁽¹²⁾. Consequently, these patients are advised to take a relatively bland diet containing little or no spices and chilies.

Capsaicinoids are botanical irritants present in chili peppers. Capsaicinoids interact with the capsaicin receptor to produce acute pain⁽²⁷⁾. Capsaicinoids are also toxic to many cells via TRPV1-dependent and independent mechanisms. In an experimental study, chili precipitated pain in one quarter to one half of patients suffering from chronic upper abdominal pain⁽¹⁸⁾. Capsaicin has been found to excite nociceptors, which are the cause for pain⁽²⁰⁾.

In a recent study, chili supplementation in diet was found to promote colon carcinogenesis⁽²⁴⁾. Early gastric vascular damage was noted in rats after oral administration of chili extract⁽³³⁾. Capsaicin has been known for its mutagenicity and tumorigenicity⁽³²⁾. Chili peppers avert predators by activating TRP channels on sensory nerve fibers to elicit pain and inflammation⁽³¹⁾.

Anal fissure is a split extending from the anal verge towards the dentate line. The pathogenesis is thought to be related to severe constipation or to straining at stool, since the hard fecal bolus may crack the anal canal⁽¹³⁾. Risk factors frequently mentioned include constipation, pregnancy and diet⁽²²⁾. A diet rich in fats, alcohol, spices and pepper as also low fluid intake had been implicated as causatives of anal fissure⁽²⁵⁾. In women, certain obstetric events have been reported to favor symptom development⁽¹⁵⁾.

As regard relationship of chilies and anal fissure, the literature is very scanty with very few papers describing effect of pepper or chilies on anal fissure and its symptoms⁽¹⁶⁾. The exact mechanism by which chilies influence the colonic and rectal physiology is not well understood^(8,10). Capsaicin, the pungent principle of hot pepper, has the ability to excite and later defunctionalize a subset of primary afferent neurons⁽¹⁾. Chilies are known to cause rectal hyperalgesia in patients with irritable bowel syndrome⁽²⁸⁾. A significant increase in the number of mucosal inflammatory cells and an increase in BrdU-immunoreactive nuclei were detected following mucosal exposure to capsaicin in the colon⁽¹³⁾. One study showed that chili supplementation promotes stomach carcinogenesis⁽⁴⁾. A case of small bowel obstruction and localized ileal perforation caused by an undigested green chili has been reported⁽²⁶⁾.

Studies have also shown that chilies have an adverse effect in the gastrointestinal tract causing duodenal ulcer⁽²¹⁾, esophageal and gastric cancer⁽²⁹⁾, ileal perforation, pruritus ani⁽⁶⁾, incisor tooth wear⁽²⁾ and cancer of the abdomen⁽⁷⁾.

One of the studies had found that spices do have an adverse effect on hemorrhoid and anal fissure symptomatology, though chilies have not been mentioned in specific⁽³⁰⁾.

Chilies are known to cause accelerated gut transit increasing frequency of stool^(17,19) which itself could be a factor aggravating symptoms of anal fissure.

CONCLUSION

Our study has demonstrated that consumption of red chili powder dose increase symptoms of anal fissure showing a direct relationship between chili consumption and symptoms of anal fissure. This was more significant with regard to increase in pain and anal burning quotients.

Gupta PJ. Efeito da pimenta vermelha nos sintomas de pacientes com fissuras anais agudas. *Arq Gastroenterol.* 2007;45(2):124-7.

RESUMO – Racional - A pimenta vermelha e outras especiarias têm sido responsabilizadas por agravar a sintomatologia das doenças anais, tais como fissuras e hemorróidas. **Objetivo** - Determinar se o consumo de pimentas vermelhas aumentaria os sintomas em fissuras anais agudas. **Métodos** - Pacientes foram recrutados e randomizados para receber cápsulas contendo pimenta ou placebos por 1 semana, somadas a analgésicos e suplementos de fibras. Foi solicitado que anotassem um escore de sintomas, tais como dor, queimação anal, prurido durante o período de estudo. Após 1 semana o tratamento foi cruzado e administrado ao mesmo grupo de pacientes com a mesma metodologia e os resultados foram anotados ao final de duas semanas. **Resultados** - Cinquenta pacientes foram selecionados e 43 completaram o estudo (22 no grupo pimenta e 23 no grupo placebo). O escore médio diário de dor foi significativamente mais baixo (2,05 no grupo pimenta e 0,97 no grupo placebo). A sensação de queimação foi sentida de modo significativo no grupo pimenta (1,85 para o grupo pimenta vs 0,71 para o grupo placebo). O escore de melhora dos sintomas foi significativamente alto após tomar o placebo. Oitenta e um virgula três por cento dos pacientes preferiram tomar placebo contra 13,9% que preferiram pimenta. Dois pacientes não referiram preferências. **Conclusão** - O consumo de pimentas agrava os sintomas de fissuras anais agudas.

DESCRITORES – Fissura anal. Pimenta. Capsaicina. Especiarias.

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Recebido em 20/7/2007.
Aprovado em 4/10/2007.