

# EFFECT OF SUBLINGUAL NITROGLYCERINE ON PAIN RELIEF IN RENAL AND URETERAL COLIC

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## ABSTRACT

The effect of sublingual nitroglycerine (TNG) on relieving pain in renal and ureteral colic was studied in a randomized, prospective, double blind and placebo controlled clinical trial.

One hundred out-patients between 16-60 years of age from either sex who were admitted to the urology emergency center of Ayatollah Taleghani and Ashrafi Esfahani hospitals were chosen for this study. They were divided into two groups; fifty-one of them were treated with TNG (0.4 mg initially and two similar doses if necessary at 5 minute intervals) and the remaining received placebo.

The scoring of pain was performed using Lee et al's method. Chi-square test was used for statistical analysis of data. Although the severity of pain was reduced one degree by TNG ( $p < 0.07$ ) in comparison with placebo, TNG was not effective in the treatment of colic pain ( $p < 0.05$ ).

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## INTRODUCTION

Acute supravescical obstruction, as from a stone lodged in a ureter, is associated with steady and continuous severe pain, usually referred to as "renal colic". It has been estimated that about 70% of out-patients who are admitted to urology emergency centers suffer from pain and 15% of physicians experience renal colic at least once during their career.<sup>3</sup> Other causes of renal colic include passage of blood clot and necrotic tissues. Differential diagnoses of renal colic are biliary colic, appendicitis, diverticulitis, irritable colon, some metabolic diseases such as acute intermittent porphyria, familial mediterranean fever and lead poisoning. Analgesics must be administered as soon as the diagnosis has been established. Among analgesics, only narcotics effectively alleviate colic pain, but their use is associated with many adverse effects. Therefore the introduction of an effective non-narcotic analgesic is considered to be important. This study was designed to evaluate the analgesic effect of TNG in renal colic.

## MATERIAL AND METHODS

On the basis of physical and clinical examinations, urine analysis and abdominal x-rays (K.U.B.), 100 out-patients with colicky pain were selected for this study. In a double blind, randomized and placebo controlled trial, they were divided into two groups. Fifty-one of them ( $36.9 \pm 10.9$  years old) were treated with TNG and the remainder ( $37.8 \pm 11.2$  years old) received placebo. TNG was administered at a dose of 0.4 mg and two similar doses were repeated, if necessary, at 5 minute intervals. Placebo was administered similarly. Other medications were used if the pain was not alleviated by 15 minutes after TNG or placebo administration.

The pain was scored according to Lee et al's method with 4 grades.<sup>8</sup>

Grade 1: No pain expression

Grade 2: Mild pain

Grade 3: Marked but tolerable pain

Grade 4: Untolerable pain (preventing walking and standing)

## Sublingual TNG in Renal Colic

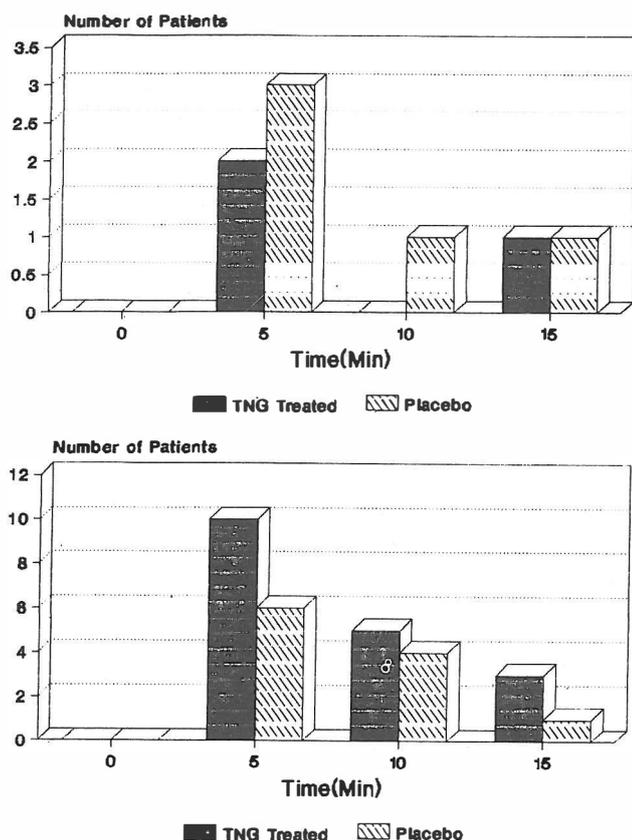


Fig. 1. Rate of pain relief in drug and placebo treated patients (According to Lee et al's method). TNG was administered at an initial dose of 0.4 mg and two similar doses were repeated if necessary at 5 minute intervals. Upper panel: decrease of pain score by one degree (4 to 3 or 3 to 2). Lower panel: decrease of pain score by two degrees (4 to 2).

The study took 3 months and the patients that were excluded are shown in Table I. Chi-square method was used for statistical analysis of data.

### RESULTS

In this investigation only patients with pain of grade 3 or 4 were studied. Of 51 patients who received TNG, 39 had a pain score of 4. The remaining were scored 3. In the placebo group 35 patients scored 4. The degree of pain relief was recorded after 5, 10 and 15 minutes following drug administration (Fig. 1). As shown in this figure there is no substantial difference between drug and placebo-treated patients concerning pain relief ( $p < 0.05$ ); however, TNG was relatively effective in decreasing the pain score by one degree ( $p < 0.07$ ).

### DISCUSSION

Several therapeutic agents are used in relieving

Table I. Patients that were excluded from the study.

- Below 16 and above 60 years old.
- Those who used narcotic and/or non-narcotic analgesics.
- Absence of radiologic signs in the patient's K.U.B.
- Absence of urinalysis findings.
- History of cardiac, renal or pulmonary disease.
- Increase of intracranial pressure or its possibility.

severe colicky pain. Narcotic analgesics such as morphine and pethidine centrally alleviate pain.<sup>2</sup>

Nonsteroidal antiinflammatory drugs<sup>1</sup> and some miscellaneous agents such as calcium channel blockers, anticholinergics and spasmolytics are also used.<sup>1,7</sup> Among these agents the most effective are narcotics, but their use is associated with many adverse effects such as respiratory depression, physical dependence and addiction. Therefore finding an effective non-narcotic analgesic is definitely worthwhile. In this study the pain relieving effect of rapid absorbable sublingual TNG was investigated. The most important adverse effect of this drug was hypotension which can be hazardous in a patient with a previous myocardial infarction.<sup>6</sup> Although in our study TNG was effective only in decreasing the pain score by one degree, it relatively alleviated colic pain ( $p < 0.07$ ). The stimulant effect of TNG on prostaglandins<sup>4</sup> and its susceptibility to physicochemical factors during storage<sup>5</sup> may be involved in the nonobvious effect of TNG in our study.

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