



The Effect Of Gum Arabic On The Absorption Of Amoxicillin

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BACKGROUND:

Gum arabic is a water-soluble polysaccharide, which is not digested by enzymes and metabolized in colon. It could be beneficial to the low-protein diet patient because it reduces serum urea; increases water and electrolyte absorption, so that it is an additive to the oral rehydration solutions, in patients with diarrhea.

OBJECTIVE: this study was conducted to study the effect of gum arabic on absorption of two widely used drugs, ciprofloxacin and amoxicillin, in healthy Sudanese volunteers. Multiple trials were conducted, Trial I, to study the effect of gum arabic on the absorption of amoxicillin. The volunteers were divided into four groups: in group i, the volunteers were given amoxicillin (500 mg) as control; in group ii, the volunteers were given amoxicillin (500 mg) and gum arabic; in group iii and iv the volunteers were given amoxicillin (500 mg) 4 hours after gum ingestion respectively. Blood samples were taken from each volunteer at times 0, 30, 60, 90, 120, 180, and 240 minutes after administration. Serum was separated and drug concentration was evaluated microbiologically. The pharmacokinetic parameters: time of absorption ($T_{1/2k}$), maximum concentration (C_{max}), area under concentration-time curve (AUC), distribution volume (V_d) and clearance (Cl) were calculated.

Trial II, to study the effect of gum arabic on the absorption of ciprofloxacin. The volunteers were divided into two groups (i and ii). In group i, the volunteers were given the drug alone and in group ii, the volunteers received the drug and gum. Urine samples were collected at 0-4, 4-8, 8-12, 12-16, 16-20, and 20-24 hours. The drug concentration was determined by HPLC.



urinary were evaluated microbiologically. The urinary (percentage of drug excreted unchanged (PDE), maximum rate (MPE), and time to this peak (TTP) were calculated before gum ingestion, maximum concentration and area under concentration-time curve were $6.09 \pm 0.46 \mu\text{g/ml}$ and $31.4 \pm 375.1 \text{ ml/min}$ respectively, and half-life of absorption was 3.87 min . After gum ingestion the C_{max} and AUC were $2.31 \pm 0.72 \mu\text{g/ml}$ and $269.3 \pm 33 \mu\text{g/ml} \cdot \text{min}$ respectively, increased to 122.99 and a ten AM and mall at a time $2025.4 \pm 319 \text{ ml/min}$ respectively and $T_{1/2ka}$ was decreased. Both rate and extent of absorption were decreased by 57.58% and 79.75% respectively. Residual effect was no significance difference was noted in group iv compared before gum arabic ingestion, the PDE was 36.96 ± 3.5 before gum ingestion to 32.34 ± 4.07 , no significance difference was noted. PDE describe the extent of absorption while MPE and TTP describe the rate of absorption. After gum ingestion concurrently with the drug, The rate of absorption decreased by 12.5% and no significance difference was noted.

CONCLUSION: Concurrent oral administration of amoxicillin with gum arabic should be administered after 4 hours from gum arabic. ciprofloxacin with gum affect the extent of absorption.