# A STUDY ON RISK FACTORS OF *TOXOCARA* SEROPOSITIVITY PREVALENCE AND THE RESULTS OF TOXOCARIASIS TREATMENT WITH ORAL ALBENDAZOL IN CHRONIC URTICARIA AT CAN THO DERMATO-VENEREOLOGY HOSPITAL IN 2021

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## ABSTRACT

***Background:*** *Chronic urticaria (CU) is defined by recurrent episodes lasting for six weeks or more and generally characterized by the sudden appearance of hives (wheal), angioedema or both. Most are idiopathic, however, one of the causes of chronic urticaria can be parasitic infection, especially Toxocariasis. Albendazol is used as a treatment for Toxocariasis. Therefore, the detection of causes, risk factors and specific treatment of the causes helps to solve chronic urticaria.* ***Objectives:*** *(1) To determine of Toxocara seropositivity in patients with chronic urticaria and identify the risk factors for toxocariasis; (2) To evaluate the results of oral albendazol in the treatment of toxocariasis in chronic urticatia.* ***Materials and Method****: A descriptive cross-sectional study of 66 chronic urticaria patients who had the result of serology for Toxocara.* ***Results****: The seroprevalence of Toxocaraiasis in this population was 19.7%. Factors such as a history of consuming the raw vegetables, raising dogs and cats habit or soil-contacting frequently were at higher risk of toxocariasis in patients with chronic urticaria. Clinical symptoms such as itching and hives in patients were significantly reduced. 30.8% of patients had ELISA results (-) after 3 months of completing treatment; 23.07% of patients had liver dysfunction; and 15.4% of patients reported side effects of epigastric pain or digestive disorders during treatment.* ***Conclusion:*** *The seroprevalence of Toxocaraiasis in this population was 19.7%. Several factors have been identified to be associated with Toxocara seropositivity. Albendazol in the treatment of Toxocara infections is highly effective and relatively safe.*

***Key words:*** *Chronic urticaria; Toxocara; Toxocariasis*

## I. INTRODUCTION

Urticaria is a common disorder, with a prevalence of approximately 15-25 percent in the general population. Urticaria is traditionally classified into acute and chronic urticaria. Chronic urticaria (CU) is defined by recurrent episodes lasting for six weeks or more and generally characterized by the sudden appearance of hives (wheal), angioedema or both [3]. CU only affects 2-3 percent of individuals but it has a significant impact on quality of life [4]. Most are idiopathic, however, one of the causes of chronic urticaria can be parasitic infection.

It is known that *Toxocara* causes human infection by ingestion of contaminated soil, water or foods where *Toxocara* eggs or larvae exist. They may be asymptomatic or cause symptoms in various organs, including the skin. Many studies have indicated the association between *Toxocara* and chronic urticaria [2]. The ratio of *Toxocara* seropositivity in patients with chronic urticaria is different according to each study. Albendazol is used as a treatment for Toxocariasis. Therefore, the detection of causes, risk factors and specific treatment of the causes helps to solve chronic urticaria, prevent related factors in order to improve the quality of life for the patient. In Vietnam, not many studies have been conducted on *Toxocara*, the association with chronic urticaria, as well as the effectiveness of albendazol in the treatment of *Toxocariasis*. Therefore, we carried out the study "A study on risk factors of *Toxocara* seropositivity prevalence and the results of Toxocariasis treatment with oral albendazol in chronic urticaria at Can Tho Dermato-Venereology Hospital in 2021" with two objectives: (1) To determine of *Toxocara* seropositivity in patients with chronic urticaria and to identify the risk factors for Toxocariasis at Can Tho Hospital of Dermato-Venereology in 2021; (2) To evaluate the results of oral albendazol in the treatment of toxocariasis in chronic urticatia at Can Tho Dermato-Venereology Hospital in 2021.

## II. MATERIALS AND METHODS

### 2.1. Study population and setting

#### 2.1.1. Study population

All patients with chronic urticaria came and had the result of serology for *Toxocara* at Can Tho Dermato-Venereology Hospital in 2021.

#### 2.1.2. Inclusion criteria

* Determine of *Toxocara* seropositivity in patients with chronic urticaria and to identify the risk factors for Toxocariasis.

- The patients were diagnosed with chronic urticaria and had the result of serology for *Toxocara* at Can Tho Dermato-Venereology Hospital in 2021.

* Evaluate of the effectiveness of treatment

- The patient was diagnosed with chronic urticaria and had a positive Toxocara serological result.
- Patients adhere to the treatment regimen and monitor treatment results.
- The patient has treated with albendazole 400 mg, 1 tablet orally twice a day for 3 weeks.

#### 2.1.3. Exclusion criteria

- Pregnant women and women who were breastfeeding.
- The patients are not qualified to answer the interview (psychiatric disorders, anacusis, etc.).
- The patients disagreed to participate in this study.
- Patients with a history of hypersensitivity to any component of albendazole.

### 2.2. Study design

A cross-sectional descriptive study

Sampling methods: convenience sampling

Sample size: the sample size is calculated with the following equation:

$$n = Z^2_{1-\frac{\alpha}{2}} \frac{px(1-p)}{d^2}$$

In which:

n: the smallest sample size Z = 95%, $Z_{1-\frac{\alpha}{2}} = 1{,}96$

p: The ratio of *Toxocara* seropositivity in patients with chronic urticaria. According to Nguyen Thai Hoa (2017) was 21.5%, choose p = 0,215.

d: the allowable error in study is 10%, d = 0,1.

Thus n = 65. The estimated sample size is 65 patients.

### 2.3. Study contents

Research on general characteristics such as age, gender, place of residence, education level, and occupation.

Determine the rate of Toxocara infection in patients with chronic urticaria and the rate of eosinophilia in subjects infected with Toxocara. Assess the relationship between seropositive Toxocara and some factors such as eating raw vegetables, eating raw meat, raising dogs and cats, washing hand habit frequently, soil contact frequently, periodic worming of pets.

Evaluate of Toxocara treatment results when using a regimen of albendazol 400 mg, 1 tablet orally twice a day for 3 consecutive weeks. Follow-up: if the following symptoms persist, add new during and after completion of treatment; ELISA, liver function, and adverse effects to evaluate the effectiveness of treatment.

### 2.4. Statistical analysis

Analyzing data with SPSS 16.0. Qualitative variables are presented as frequencies (percentage). Quantitative variables with no diagnostic distribution are presented as the median (interquartile range). To compare 2 or more ratios, we use Chi-squared or Fisher's test, $p<0.05$ is considered to be statistically significant.

### 2.5. Ethics Approval

This study is authorized by Can Tho Dermato-Venereology Hospital. Patient information was encrypted and kept confidentially. Data collection sheets, file files were stored carefully. Patients had the right to refuse to participate in the study without affecting the quality of examination and/or treatment. The study only has research purposes and no harmful effects on participants.

## III. RESULTS

**Table 1.** Toxocara seroprevalence in patients with chronic urticaria

| ELISA | Frequency (n) | Ratio (%) |
|---|---|---|
| Positive | 13 | 19.7 |
| Negative | 53 | 80.3 |
| Total | 66 | 100 |

**Comment**: 19.7% of the 66 patients were serologically positive for Toxocara by ELISA.

**Table 2.** Eosinophilic rate of Toxocariasis in patients with chronic urticaria

| **Eosinophilia** | **Frequency (n)** | **Ratio (%)** |
|---|---|---|
| Yes | 2 | 15.4 |
| No | 11 | 84.6 |
| Total | 13 | 100 |

**Comment**: Eosinophilic rate of Toxocariasis in patients with chronic urticaria was 15.4%.

**Table 3.** Risk factors of Toxocariasis in patients with chronic urticaria

| **Risk factors** | **Rate (%) by *Toxocara* ELISA** | | **OR** | **P** |
|---|---|---|---|---|
| | **Positive cases (n=13)** | **Negative cases (n=53)** | | |
| Eating raw vegetables | 91,6 | 39,6 | 8,381 (1,685-41,679) | < 0,05 |
| Eating raw meat | 69,2 | 45,3 | 2,719 (0,744-9,936) | 0,122 |
| Raising pets | 76,9 | 30,1 | 7,708 (1,868-31,802) | < 0,05 |
| Washing hand habit frequently | 38,5 | 77,4 | 0,183 (0,05-0,664) | < 0,05 |
| Soil contact frequently | 69,2 | 18,9 | 9,675 (2,473-37,849) | 0,001 |
| Periodic worming of pets | 15,4 | 64,7 | 0,136 (0,22-0,860) | < 0,05 |

**Comment:** Factors such as eating raw vegetables, raising dogs and cats, and frequent contacting with soil are factors that increase the risk of Toxocara infection ($p < 0,05$). Other factors, such as frequent hand washing or periodic deworming for dogs and cats, reduce the risk of Toxocara infection ($p<0,05$). There was no statistically significant difference between Toxocara infection and raw meat consumption.

**Evaluation of treatment results**

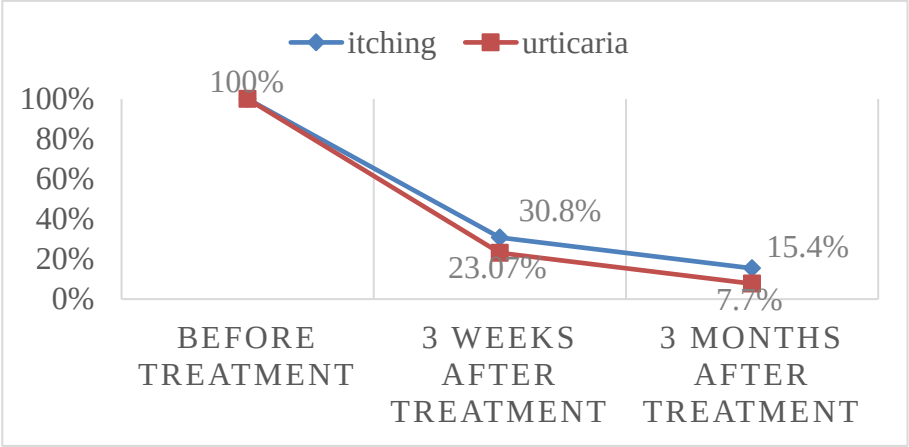


**Figure 1.** Comparison of clinical symptoms before and after 3 weeks of treatment, 3 months of treatment completion

**Comment:** The clinical symptoms of 13 patients with chronic urticaria infected with Toxocara were significantly reduced after 3 weeks of treatment: itching (100%-30.8%), urticaria (100%-23.07%). After 3 months of completing treatment, the clinical symptoms in

infected people have a significantly reduced rate: itching (100%–15.4%); urticaria (100%–7.7%). The change in itching and urticaria symptoms before and after 3 weeks and 3 months of completion of treatment was statistically significant with p < 0,001.

**Table 4.** Toxocara serum monitoring after 3 months of completion of treatment

| **Evaluation time** | | | |
|---|---|---|---|
| | **Positive** | **Negative** | **p** |
| **Pre-treatment** | 13 (100%) | 0 | 0.04 |
| **Post-treatment** | 9 (69.2%) | 4 (30.8%) | |

**Comment:** After 3 months of completing treatment, we found that all patients had a decrease in Toxocara serum levels, and 30.8% of infected people had negative ELISA results. The change in ELISA test index was statistically significant, with p < 0.05.

- Monitor liver function after 2 weeks of treatment: 23.07% of patients have liver dysfunction.

- Undesirable effects of treatment with albendazole: abdominal pain 15.4%, headache 0%, fever 0%, hair loss 0%, other 0%.

## IV. DISCUSSION

With the results showing that the rate of seropositivity for Toxocara (19.7%) was higher than that of Oteifa et al. (13%), Mehmet et al (17.8%) but lower than the results of Rosanna Qualizza (31.8%), Quy Hoa Central Leprosy and Dermatology Hospital (21.5%) [6], [1], [3].

The prevalence of eosinophilia in chronic urticaria patients infected with *Toxocara* was 15.4%. Our results are also consistent with the author Tran Trong Duong's research in 2011-2012, which recorded the rate of eosinophilia at 17.75% [5].

Investigating factors related to Toxocara seropositivity, noting the relationship between factors such as eating raw vegetables, contacting soil, raising or holding dogs and cats, increases the rate of seropositive Toxocara. Statistical significance, p < 0.05. Besides, factors such as the habit of washing hands frequently before eating or after contacting with soil, periodic deworming for dogs and cats also reduces this infection rate. Our findings are also consistent with those of author Nguyen Thi Thanh Quan, who found links in a variety of factors such as soil contacting habits, periodic deworming for dogs and cats, and frequent hand washing habits [7]. Research by author Bui Van Tuan and colleagues recorded a higher infection rate in subjects with dogs and confirmed a link between Toxocara infection and dog ownership [10]. The results of our study are different from that of author Le Thi Cam Ly, who studied in 2014-2015, noting that there was no association between periodic deworming and the rate of *T. canis* infection [8].

In our study, clinical symptoms were significantly reduced after 3 weeks and 3 months of completing treatment: itching (100%-30.7%-15.4%); hives (100%-23.07%-7.7%). The change of itching and hives symptoms before and after 3 weeks and 3 months of completion of treatment was statistically significant with p<0,001. Our results are also consistent with the study of Luong Truong Son et al. (2013). Treatment of toxocariasis with albendazole is highly effective. After treatment, skin itching and urticaria significantly decreased. Especially after treatment, patients feel better eating and sleeping [9].

After 3 months of completing treatment, we found that all patients had a decrease in Toxocara serum levels, and 30.8% of infected people had negative ELISA results. The change in ELISA test index was statistically significant, with p < 0.05.

Anti-parasite antibodies usually persist for years after specific therapy, after clinical manifestations have ceased. Therefore, monitoring the fluctuations of antibody titres to evaluate treatment outcomes is somewhat limited. However, it is still recommended to follow up every 3 months until completely negative for final conclusions.

After treatment with albendazole 400mg at a dose of 800mg/day/2 times after a full meal, 2 of 13 infected people showed signs of epigastric abdominal pain or digestive disorders (15.4%); there were 3 cases of dysfunction liver function (23.07%).

## V. CONCLUSION

The rate of seropositivity for Toxocara in patients with chronic urticaria was 19.7%. Several factors have been identified to be associated with Toxocara seropositivity. albendazole in the treatment of Toxocara infections is highly effective and relatively safe.

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