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### The Relationship between Blood Group Type and Cutaneous Leishmaniasis in Aleppo

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#### Abstract

**Background:** Cutaneous leishmaniasis (CL) is a health problem, especially in tropical and subtropical countries. In spite of new scientific developments in recent years, several questions related to this disease have been raised that have still no answer. This study was performed to investigate the relationship between blood group type and CL among Syrian patients.

**Methods:** of 100 suspected CL patients referred to the Aleppo University Hospital Clinic, 60 patients were randomly selected and after the diagnosis of CL was made by tissue smear and skin biopsy their blood groups and RH factors were determined and recorded in a questionnaire. Similarly 600 volunteers referring to the Blood transfusion center were randomly selected and their blood group and RH factor were determined with a similar method. Data were analyzed by using Chi-Square test.

**Results:** There were 38 males and 22 females among CL patients. There was no significant difference between the case and control groups in regard to the frequency of blood groups and RH . In both the CL and control groups, the highest percentage was of blood group O ve and the lowest of blood group AB-ve.

**Conclusions:** Our results showed that the blood group was not a risk factor in the occurrence of CL. The ABO-Rh blood groups were not associated with the occurrence of CL in Syrian patients. As CL disease is becoming more complex, it is necessary to conduct further clinical basic studies in endemic areas.

#### Introduction

Leishmaniasis is prevalent in 88 countries , affecting an estimated 12 million people with approximately 2 million new cases per year , 500 000 of which are visceral leishmaniasis (VL) and

1 500 000 CL (90% of them in Afghanistan, Algeria, Brazil, the Islamic Republic of Iran , Peru, Syria, Saudi Arabia and Sudan) . Cutaneous leishmaniasis is an important health problem caused by the flagellated protozoa , *Leishmania major* and *L. tropica* . *Leishmania* is transmitted by female sandflies , *Phlebotomus* species . After 1 to 12 week incubation period , the lesion appears as a red papule enlarging to nodule or plaque with a purple infiltrative border and central crust. Spontaneous healing occurs after 6 to 12 months, with a remaining scar . Clinical diagnosis is usually easy in patients coming from an endemic area having discrete, relatively painless skin lesions . The demonstration of Leishman - Donovan bodies (amastigotes) in Giemsa - stained tissue smears or histology sections from lesions and culture of *Leishmania* organisms on Novy , MacNeal and Nicoll's (NNN) medium are considered to be confirmatory tests of CL . Although the disease is self limiting , for it's long duration and scarring , an effective treatment is needed . Pentavalent antimonite compounds including sodium stibogluconat (Pentostam) and meglumine antimonial (Glucantime) are common treatments for cutaneous leishmaniasis . [1,2,3,4,5] During the past eight decades a large number of studies have examined the possible relationship between blood type and infection . The interaction of pathogen and erythrocyte membrane may reflect antigenic similarity adhesion through specific receptors , or modulation of antibody response . Anthropological surveys suggest that the geographic and racial distribution of human blood groups reflects susceptibility of populations with specific blood types to the plague , cholera , smallpox , malaria and other infectious diseases . [6] The main aim of the present study was to investigate the relationship between blood group type and CL among Syrian patients .

## Materials and Methods

This study was carried out in the Department of Dermatology and Venereology, Aleppo University Hospital , Aleppo , Syria during the period from November 2009 to February 2010 .

Sixty patients who were clinically suspected for CL were enrolled . The diagnosis was mainly clinical -a typical chronic nonhealing indurated papule, nodule or plaque with or without crusting in patients referring to the Aleppo Hospital Clinic . Tissue smear and/ or skin biopsy was carried out to establish the diagnosis. Skin biopsies were taken from the active indurated margin of the lesion under aseptic conditions . A 4 mm tissue sample was taken using a sterile biopsy punch . The distribution of blood group type of all infected patients was compared with that of a control group of 600 normal donors . Statistical comparison was performed to find out the relationship between blood group type and CL, using Chi-Square test .

## Results

There were 39 males and 21 females among CL patients . In both the CL and control groups , the highest percentage was found in blood group O+ve and the lowest in blood group AB-ve . The ABO and RH blood group distribution are shown in the Table 1 for the CL patients and in the Table 2 for normal donors without any significant difference ( $p=0.95$ ) .

Blood group	A	B	O	AB	Total
RH +ve	13	10	19	7	49
RH -ve	4	2	5	-	11
Total %	28.3	200	40	11.7	60
					100%

**Table 1:** CL patients (Case group) with different blood groups.

Blood group	A	B	O	AB	Total
RH +ve	175	102	210	44	531
RH -ve	22	15	30	2	69
Total %	32.8	19.5	40	7.7	600
					100%

**Table 2:** Blood groups of 600 normal blood donors (Control group) referred to Blood

## Discussion

Anthropoctic cutaneous leishmaniasis (ACL) is still endemic in its traditional home of Aleppo, and also in Edlib, Latakia, Tartous, Hama and the city of Damascus. ACL represents about 90% of all CL cases in the Syrian Arab Republic. The vector is *Ph. sergenti*, and there is no evidence of a non-human reservoir host. Leishmaniasis is a notifiable disease in the Syrian Arab Republic. Greenblatt et al. (1981) have hypothesized that the leishmanial parasite might utilize a system of camouflage or mimicry of host blood group antigens to invade host defense mechanisms in human. Our results showed that the blood group was not a risk factor in the occurrence of CL. The findings failed to support the hypothesis of Greenblatt et al. (1981). So, we conclude that ABO-Rh blood groups are not associated with the occurrence of CL in Syrian patients. The conclusion of our study is similar to that of Aflatoonian M.R et al.(2007), Kumar et al. (2008) [7,8,9] which failed to support the hypothesis of camouflage, using blood group antigens.

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