

Activity of Doxorubicin against Leishmania tropica

Complete healing of cutaneous lesions after 24 hours of single dose

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Background

- **Annually:** 0.7-1.2 million new cases around the world ⁽¹⁾
- **In Syria:** 85% of cutaneous leishmaniasis (CL) cases are related to *L. tropica* ⁽²⁾
- **Aleppo:** is one of the most epidemic areas in the world (12000 new cases annually) ⁽²⁾
- **Symptoms:** papules on the skin that was exposed to sandflies ⁽³⁾
cosmetically unacceptable lesions and may leave permanent scars ⁽³⁾
- **CL complications:** multiple lesions, large lesions, chronic lesions, lesions over joints, mucosal disease, and nodular lymphangitis ⁽⁴⁾
- **Treatment of Choice:** Pentavalent antimony compounds ⁽⁴⁾
- **Toxicity of the treatment:** heart, liver, pancreas, hematopoietic tissues ⁽⁴⁾
- **Treatment failure:** 20% in recent years ⁽⁵⁾
- **Doxorubicin** is an anticancer drug from topoisomerase II poisons ⁽⁶⁾

Objective

Evaluation of the potency and efficacy of doxorubicin against Cutaneous Leishmaniasis caused by *L. tropica* in vitro and in-vivo

Materials and Methods

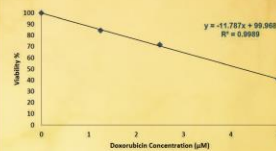
Potency against promastigotes: ELISA technique (XTT cell proliferation kit II, Roche)
Potency against Intracellular amastigotes: In-vitro model of *L. tropica* infection
Efficacy in curing cutaneous lesions in BALB/c mice: In-vivo model of *L. tropica* infection
IFN-γ level detection in mice serum: ELISA technique (Mouse IFN-γ ELISA kit, Koma Biotech)
Doxorubicin: Lyophilized 10 mg, solved in serum (Roxorin, Richmond)

Results

IC50 promastigotes

48 h incubation in 26°C

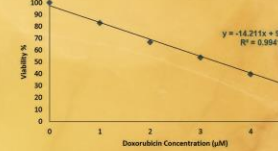
$4.24 \pm 0.2 \mu\text{M}$



IC50 amastigotes

48 h incubation in 37°C and 5% CO₂

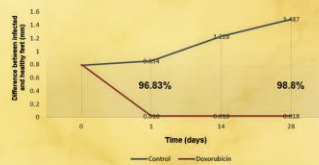
$3.34 \pm 0.2 \mu\text{M}$



Cutaneous lesion healing

After 24 hours: **96.83%** (p<0.05)

After 4 weeks: **98.8%** (p<0.05)

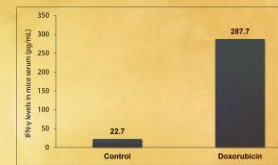


IFN-γ level

After one week of single dose

$287.7 \pm 23.4 \text{ pg/mL}$

P< 0.05



Discussion

Doxorubicin was potent against *L. tropica* promastigotes and intracellular amastigotes
 Doxorubicin completely cured cutaneous lesions in BALB/c mice after 24 hours of single dose without relapse
 High efficacy of doxorubicin may be due to the increase in IFN-γ levels in mice serum
 Topoisomerase II may be a promising target of antileishmanial drugs

Conclusion

Our study demonstrates that single dose of doxorubicin may be a promising, effective management of cutaneous leishmaniasis caused by *L. tropica* with no relapse.

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Graphic Sources



References

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