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THERAPEUTIC EFFECT OF LOCAL FLAXSEED OIL (*LINUMUSITATISSIMUM*) ON PATIENTS WITH *LEISHMANIATROPICA* COMPARED WITH PENTOSTAM

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Abstract:

In this study flaxseed oil was extracted using petroleum ether solvent, and then ointments were made from the oil at a concentration of 5% and used in the treatment of pimples caused by the *Leishmaniatropica*.

The research showed that all persons who were included in the present study recovered completely in a record time of no more than 10 days, compared to the group of patients treated with Pentostam. The toxicity of oils extracted from flaxseeds was studied through liver function testes and renal function testes, which makes it very appropriate in treating people with cutaneous leishmaniasis, as GOT, GPT, and ALP have not had any significant increase. Their averaged were 33, 37 and 102 U/L, respectively, compared to the group of people treating with Pentostam, who averaged 37, 43 and 137 U/L, respectively. Likewise, no toxic effect was observed on the kidneys through urea and creatinine screening, as the rates for those treated with oils reached 35 and 0.7 mg / dL of blood compared to the group of patients treated with Pentostam, whose rates reached 33 and 0.9 mg/dL, respectively.

key words: Flax oil, *Leishmania tropica,* Pentostam.

Introduction:

Leishmania tropica, which causes cutaneous leishmaniasis, is one of the most common parasites in the world that infects human skin cells (Peters 1998S; Chwarz *et al*., 2017 ; Al-Doori 2020a). The chemical drug used in the treatment of cutaneous leishmaniasis is pentavalent antimony, also known as sodium stibogluconate or Pentostam®. Pentostam has many disadvantages, including it is toxic to the heart, liver and pancreas. Treatment with Pentostam is accompanied by severe pain in addition to its side effects, which include loss of appetite, nausea, headache and rash (Oryan and Akbari, 2016). The toxic effects of drugs can be detected by measuring liver enzymes and kidney function. The liver is the most important organ for protein production and detoxification, both of which are facilitated by a myriad of enzymes. By analyzing these enzymes and proteins that liver cells release into the blood, the health of the liver can be analyzed. Standard liver tests that assess liver damage include the enzyme alanine aminotransferase (ALT) also known as glutamic pyruvic transaminase (GPT), aspartate aminotransferase (AST), known as glutamic oxaloacetic transaminase (GOT) and alkaline phosphatases (ALP)

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(Kasarala and Tillmann, 2016). GPT enzyme is the most specific indicator of liver function and is used as a direct indicator of hepatitis or infection, while GOT enzyme is the least specific indicator than its predecessor because it is secreted from other organs in addition to the liver (Lee, *et al*., 2004). Damage to the bile duct leads to elevated basal phosphate. The Serum Alkaline Phosphatase ALP test is specifically used to assess cholangitis and sclerosis (Kwo, *et al*., 2016). As for the kidneys, the most important tests that are carried out to assess their health are B.Urea and creatinine. As for the urea examination, it is conducted to assess the health of the kidneys and diagnose their diseases, as well as in the follow-up and evaluation of the types of treatment and their effect on the kidneys. Urea is the substance that is produced in the liver as part of the process of metabolizing proteins into amino acids, and this process produces ammonia, which in turn turns into urea, and after the formation of urea and its transfer to the blood, it is filtered in the kidneys before being excreted in the urine, where a limited part of it remains in the urine. the blood. In the case of kidney disease, this substance is not excreted in the urine, which causes an increase in its proportion in the blood. On the other hand, the level of this substance decreases in cases of liver diseases due to its inability to form protein (Pagana *et al*., 2015). As for creatinine, this analysis is used for the same purposes mentioned above with urea. Creatinine is produced by muscle as a result of the breakdown of creatine, which is produced during the energy production cycle for muscle contraction (Pagana and Pagana, 2011). In addition to the toxicity of some chemical compounds, the high material cost of a number of chemical drugs poses a problem to the poor classes, so there was a need to search for new effective substances with a safe and effective effect. In 1978 the World Health Organization (WHO) called for the use of traditional medicine to treat diseases microbial and parasitic; Medicinal plants are an essential and effective source of modern traditional medicines, as well as often free from side effects (Oyi *et al*., 2007).

Flax Linum usitatissimum is one of the oldest vegetable crops known to have been cultivated since antiquity for oil, fibre, or both. Flax belongs to the Linaceae family (Millam, *et al*, 200; AL – Doori, 2020b). It is believed that the regions of southwest Asia and the Mediterranean are the main areas for flax cultivation (Jhala and Hall, 2010). Flax seeds are used as analgesics and laxatives, control blood sugar, improve autoimmunity, lower blood cholesterol, prevent blood clots, reduce atherosclerosis, and reduce the risk of cancer. Flax seeds contain glycosides, alkaloids, flavonoids, saponins, resins, and fatty acids such as stearic. Linoleic, oleic, myristic and palmitic (Prasad, 1999).

The study aims to use flax seed oil in the treatment of cutaneous leishmaniasis patients as an alternative treatment to synthetic chemical treatments.

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Materials and methods:

Experience site:

The current study was conducted in Salah El-Din General Hospital, and the study included 86 patients with cutaneous leishmaniasis of both sexes and of different ages.

Collect flaxseeds:

The flax seeds were collected from the local markets in Mosul, and classified in the Medicinal Plants Development Center in the Mosul Dam of the Iraqi Ministry of Agriculture. The seeds were cleaned of dust and what was suspended in them, then placed in paper bags and kept in conditions away from moisture until use.

Taxonomic position of the flax plant:

Kingdom plantae-plants
Subkingdom tracheobionta – vascular plants
Superdivision spermatophta – seed plants
Division magnoliophyta – Flowering plants
Class magnoliopsida – Dicotyledons
Subclass Rosidae
Order: Lineles
Family: Linaceae – Flax family
Genus: Linum L. – flax
Species: ***Linum usitatissimum.***

Preparation of the oil extract using a Soxhlet continuous extraction device:

The seeds of the plant were crushed by an electric mill, 25 gm of seed powder was put into a batch, and then 400 ml of petroleum ether was added to extract the oil from the flaxseeds. The extraction continued at a rate of 7 hours a day until the solvent used in the device became colorless, and then the extract was concentrated by a Rotary vacuum evaporator at a temperature of 40C° (Al-Daody, 1998).

Preparation of oil concentrates:

The concentrations (25, 50, 75 and 100) µg/ml were prepared by dissolving oils with Ethylene glycol to obtain the above concentrations.

Preparation of the ointment:

The medicinal form of the extract was prepared by adding 0.5 ml of oils to 9.5 ml of pure petrolatum to prepare a 5% concentration.

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Processing method: The treatment is applied as a wipe on the Baghdad grain twice a day, in the morning and in the evening, during a period ranging from 5 to 15 days. Compared with the control group of 26 who were treated with Pentostam, the common drug in the treatment of leishmaniasis. The number of those included in the study was 86 patients of both sexes, and their ages ranged between one year and 44 years, after their written consent or the consent of the children's parents was taken.

Results and discussion:

Treatment of people with cutaneous leishmaniasis:

Through clinical trials conducted on patients with cutaneous leishmaniasis in different areas of their bodies, such as the face and extremities, with a concentration of 0.5% of oils, treatment with these oils isolated from the flax plant led to good results, as all patients were cured in a record time that does not exceed 10 days. Completely without leaving a permanent scar or trace, as the signs of response to treatment started on the third day of treatment with less redness around the rash and the lesion appeared smaller than it was before treatment, in addition to the lack of skin thickening around it as in the pictures (5-8) compared to the group The 26 patients of the same age, of both sexes, who were treated with Pentostam were treated with Pentostam, the treatment period for them took a whole month, with one session every 10 days. Pentostam treatment includes high toxicity and a longer time, in addition to the injection pain (Oryan and Akbari, 2016).

Several tests were performed on patients treated with both treatments (Table 10), which included liver function tests: glutamic-oxaloacetic transaminase (S. GOT), glutamate pyruvate transaminase (S. GPT), alkaline phosphatase (S. ALP) and liver function tests. Kidney function blood urea and serum creatinine to test the toxicity of treatment with the extract in addition to the total white blood cell count (WBCs count) The patients included in the study were followed up for six months after treatment in order to ensure that the Baghdad pill did not reappear

Table No. 1 shows the distribution of injuries among the injured in the current study of both sexes and of different age groups:

Processing type	gender	the number	age stages			
			1-11	12-22	23-33	34-44
Flax oil treatment	Male	48	23	11	9	5
	female	38	17	13	7	1
	Total	**86**	**40**	**24**	**16**	**6**
Pentostamtreatment	Male	15	7	3	3	2
	female	11	5	2	3	1
	Total	**26**	**12**	**5**	**6**	**3**

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Table No. 1 above shows the total number of 86 patients with cutaneous leishmaniasis treated with linseed oil of both sexes. The total number of males was 48 and the total number of females was 38, distributed over the age groups from one year to 44 years. The highest incidence of infection was in males in the age group 1-11 years, as well as in females, and the lowest was in the age group 34-44. The results were compared to a group of 26 patients of both sexes treated with Pentostam for the same age groups.

Table No. 2 shows the various examinations performed on patients after 10 days of treatment:

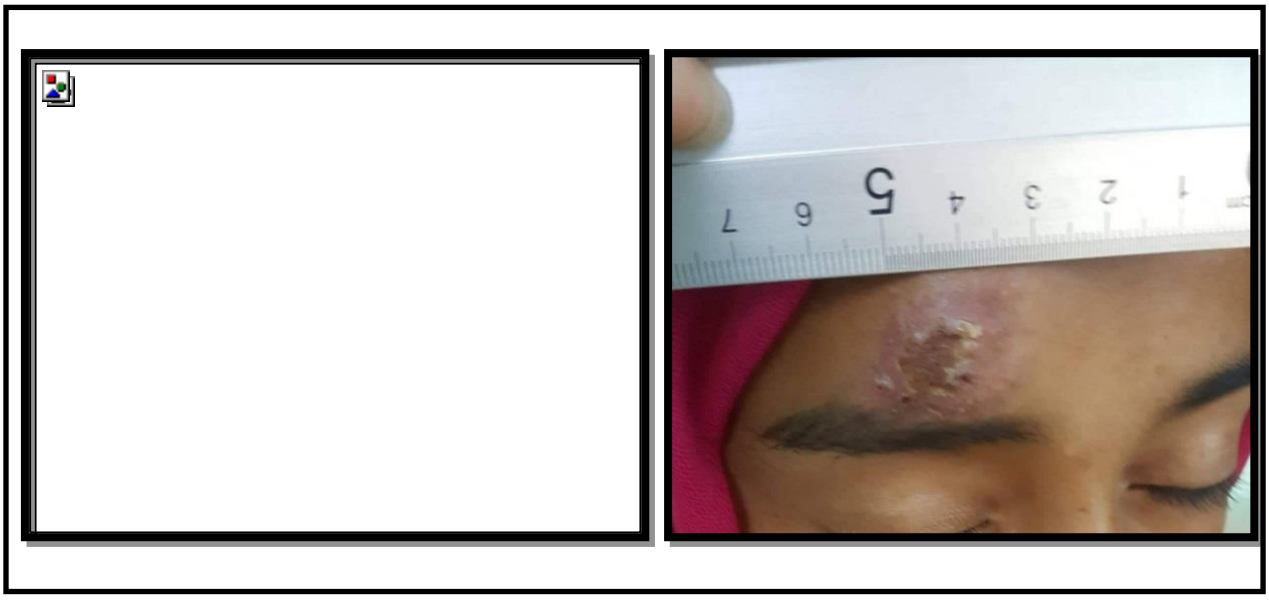
Checkups / treatment	**GOT* n.v.** = up to 45U/L**	**GPT n.v. = up to 45U/L**	**ALP n.v. = up to 45U/L**	**B. Urea n.v. = 15-45mg/dl**	**S.creatinine n.v. = 0.2 – 1.2mg/dl**
Flax oil	33	37	102	35	0.7
Pentostam	37	43	137	33	0.9

* represents the rate

** normal value (n.v.)

Through Table No. 2 above, it is clear to us that there is no toxicity for treatment with flax oil, which makes it very suitable in the treatment of patients with cutaneous leishmaniasis, as there was no significant increase in the liver enzymes GOT, GPT and ALP, as their rates reached 33, 37 and 102 compared with the group of people treated with Pentostam, who reached Their rates are 37, 43, and 137 IU/L, respectively.

Also, no toxic effect on the kidneys was observed by conducting the urea and creatinine tests, as their rates for those treated with flax oil were 35 and 0.7 mg / 100 ml of blood compared with the group of patients treated with pentostam, whose rates were 33 and 0.9 mg / 100 ml on the other. Straight



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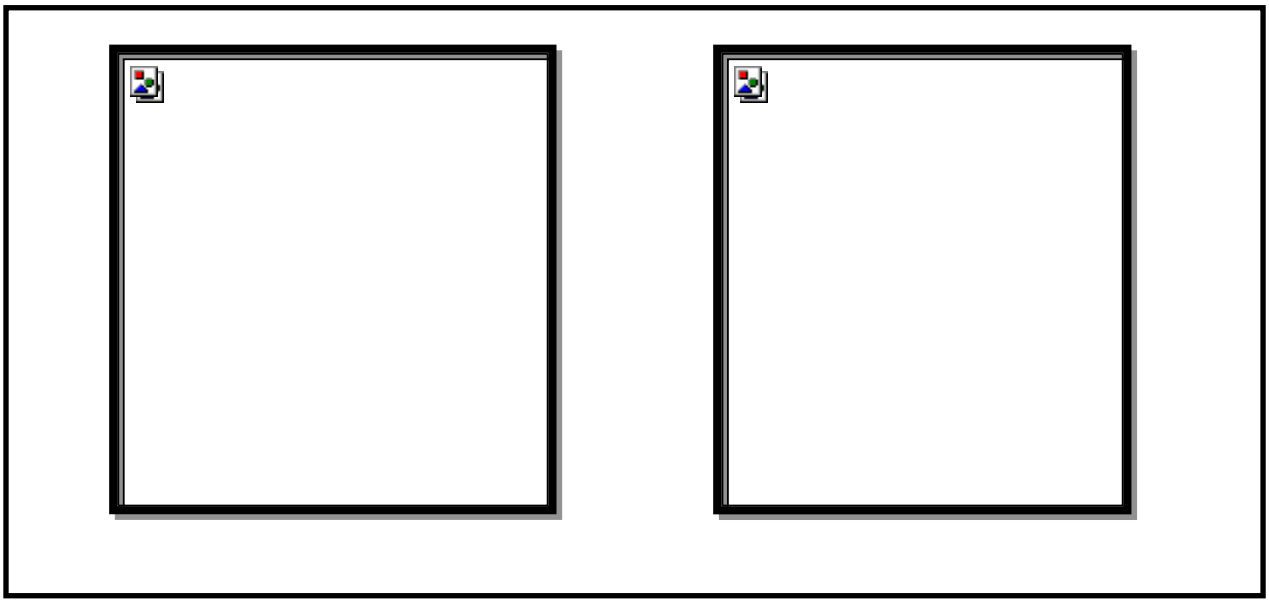
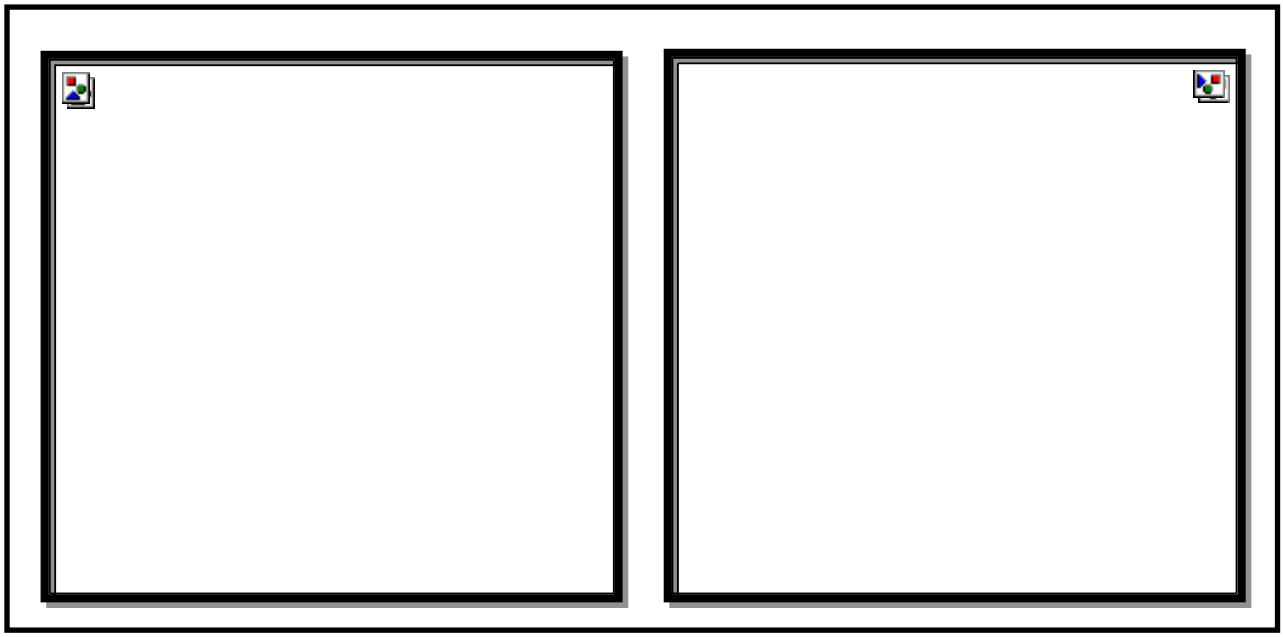
Picture No. (1): A picture of a girl, A with a Baghdad grain, 2.5 cm in diameter above the right eyebrow, B after 5 days of treatment.



Picture No. (2): A Baghdad pill before treatment, B after 6 days of treatment



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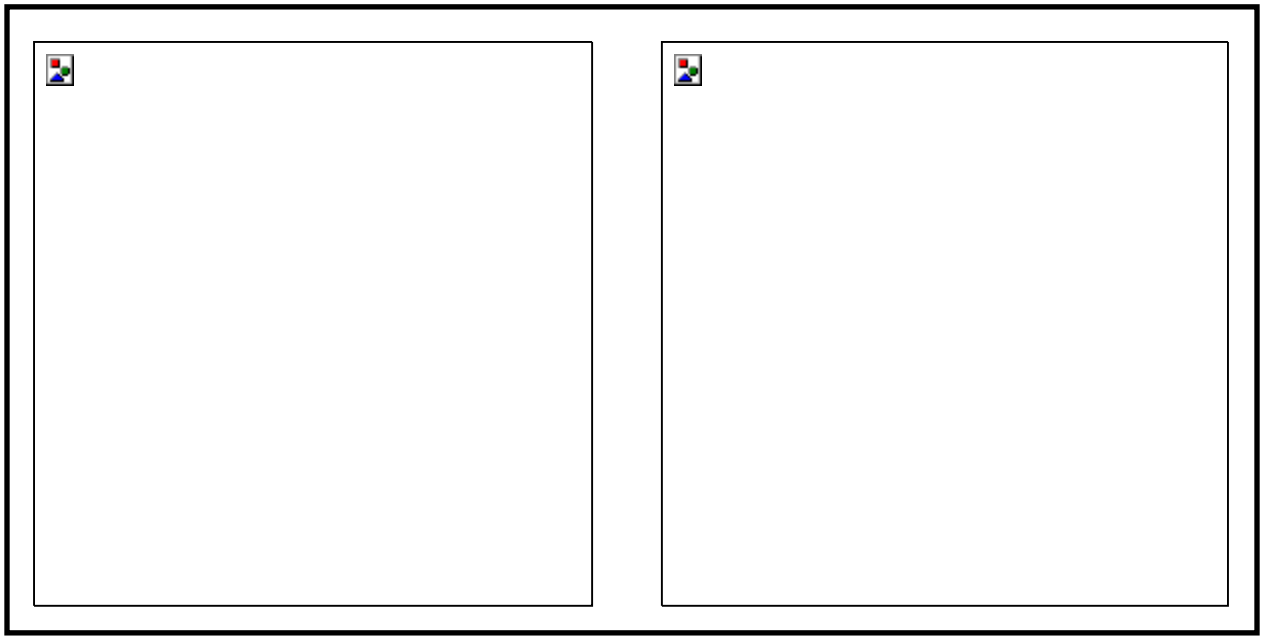
Picture No. (3): A child with cutaneous leishmaniasis on his right cheek. The two pictures show the improvement in the condition after 4 days of treatment.



Picture No. (4): A man with cutaneous leishmaniasis in his left hand. The two pictures show the improvement in the condition after 8 days of treatment.

Conclusion:

The study demonstrated the therapeutic effect of flaxseed oil in treating cutaneous leishmaniasis patients without side effects, as well as ease of use and low cost.

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