

PERCEPTION AND PROGRESS OF MAGGOT THERAPY: A PROSPECTIVE STUDY IN MOROCCO

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ABSTRACT

Introduction: The use of antibiotics after the Second World War was a significant medical event because of the high healing potential of bacterial infections. However, infections due to multi-drug resistant bacteria are increasing worldwide and have become a major public health problem. This urges us to look for alternative methods such as maggot therapy, which has been proven to have incredible effectiveness in the management of several pathologies such as diabetic foot and infections due to multi-drug resistant bacteria. However, the introduction of Maggot therapy into the therapeutic arsenal requires a perception study among physician prescribers and patients. Therefore,

the aim of our study is to understand the place of the maggot therapy in the current stake of fight against the multi-resistant infections and to study its perception among Moroccan physician prescribers and patients. **Subjects and Methods:** A prospective study was carried out, covering a 5 month period, from 10 July 2017 to 13 December 2017. It focused on 321 patients suffering from different injuries and 103 physician prescribers interviewed in various hospital settings from three regions in Morocco. The results were exploited using computer software, survey and statistical data analysis, the Sphinx plus V.5. **Results:** Only 25% of the 301 interviewed physician prescribers were aware of the maggot therapy during the study period. After outlining the benefits of larval treatment, 95% of them agree to handle and even use, it in many cases, as an alternative to conventional treatments. Moreover, we also noted

that 66.5% of the 321 interviewed patients accepted treatment with maggot therapy. The young and male population is the most courageous for this type of treatment with a sex ratio of 2.19. **Conclusions:** The maggot therapy is an old technique that has proven its effectiveness in the management of several pathologies, particularly the diabetic foot and infections due to multi-drug resistant bacteria. Nowadays, this technique is starting to be reintegrated in several countries. The study of the perception of the maggot therapy is an urge to improve its progress among the therapeutic arsenal in the world and in Morocco as well.

KEYWORDS: Maggot therapy - *Lucilia sericata* - Bacterial resistance.

INTRODUCTION

The appearance of antibiotics after the Second World War was a significant medical event because of the high healing potential of bacterial infections. However, antibiotic resistance and the lack of marketing of new antibiotic molecules have limited the treatment of a number of diseases and condemned several patients to a therapeutic impasse. This has sparked a new interest in alternative methods including maggot therapy. In the years 1990/1995, simplicity, efficiency and low toxicity led physicians to accept this type of treatment of pleasures around the world.^[1] Maggot therapy, or larvothérapie in French, is a therapeutic technique that relies on the use of larvae of the greenfly, *Lucilia sericata* or *Phaenicia sericata* for therapeutic purposes. In effect their larvae feed exclusively on dead or necrotic tissue, unlike other species that also feed on healthy tissue, which is harmful because they can be the cause of disease or infection.^{[2][3][4]}

Larval therapy uses sterile larvae, it is a form of artificially induced myiasis in a well controlled clinical situation. The effects of larvae on wounds can be divided into three general mechanisms: debridement, antimicrobial effect and stimulation of wound healing.^[4] Debridement involves ridding the wound surface of necrotic tissue and fibrin. The antimicrobial effect is obtained by the secretion of bactericidal substances: Allantoin, Phenylacetic acid and Phenylacetaldehyde.^[5] The larvae have a mechanical action and ensure a decrease in the bacterial load adhering to necrotic tissue. The passage of bacteria thus absorbed into the digestive tract of the larvae seems to be fatal.^[6] Stimulation of healing is achieved by increased proliferation of fibroblasts in the presence of different secretions of the larvae. The goal of the maggot therapy is to take advantage of the ability of the larvae to decompose and ingest infected or necrotic tissue to clean a wound and facilitate its healing.^[3]

Currently, larval therapy is universally recognized and can be used to treat chronic, long, and infected wounds that have not previously responded to conventional treatment. Such wounds are generally characterized by the presence of necrotic tissue, an underlying infection and poor healing.

In Morocco, the introduction of maggot therapy into the therapeutic arsenal requires a perception study among prescribers and Moroccan patients. The objective of our investigation is to understand the place of the maggot therapy in the current stake of fight against the multi-resistant infections and to study its perception among the prescribers and the Moroccan patients.



Photo N°1: Treatment of an Infected Wound by Maggot Therapy^[7]



Photo N°2: Treatment using Maggot therapy^[8]

MATERIALS AND METHODS

It is a prospective, descriptive and analytical study spread over a period of 5 months, from 10 July 2017 to 13 December 2017, carried out in three regions of Morocco: the Souss-Massa-Drâa region, the Casablanca-Settat region and the Rabat-Salé-Zemmour-Zaer region.

The criteria for inclusion of our survey are all prescribing physicians whatever their specialties. Also included in our study are all adult subjects, men or women, over the age of 15 and coming to see a doctor in the hospitals and also without any medical consultation. Exclusion criteria are non-prescribers and the population under 15 years of age.

The perception of maggot therapy, in the prescribers and the Moroccan patients, is studied thanks to two questionnaires. The first, for patients, is written in Arabic and French and is in

paper format. The second, intended for prescribers, is written in French only and comes in two forms. Either in paper format, manually filled by the prescriber directly on site. Either in digital format formulated by "Google Form" and completed online by prescribers. The vast majority of questions are dichotomous.

The prescribing physicians 'and patients' questionnaires were used with Sphinx plus V.5 computer software. It is software for investigation and analysis of statistical data.

RESULTS

Our study has a population of 321 patients of which 62.6% are men and 37.4% are women, with a sex ratio of 1.67. Among all our patients, the age group 25-35 years is predominant with a rate of 53.3%, followed by the age group 35-45 years (27.7%), then the age group 15 - 25 years (17.1%) and the 45-70 age group (1.9%). The results of our survey reveal that 66.4% of our subjects immediately accept treatment with maggot therapy with a predominance of male sex (68.1%). The 25-35 age group is the one that most commonly accept treatment with maggot therapy, both in men (53.1%) than in women (53.7%). Figure 1 shows the acceptability of maggot therapy by sex and Figure 2 shows the acceptability of maggot therapy according to the age group of the subject.

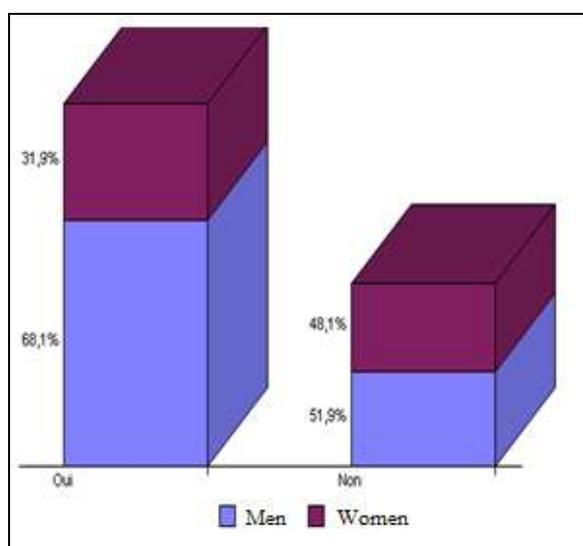


Figure 1: Acceptability by sex

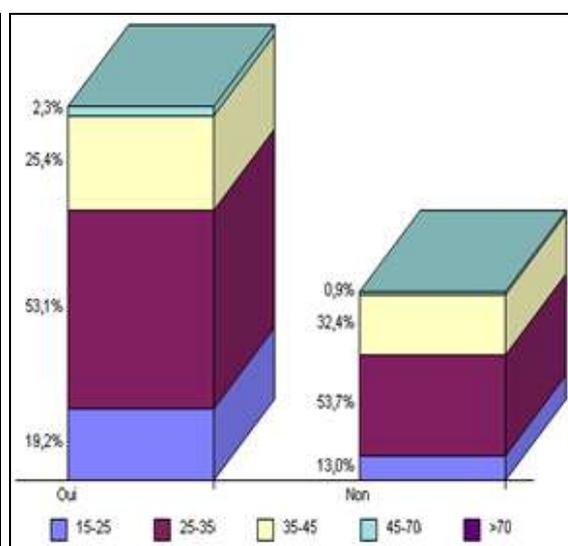


Figure 2: Acceptability by age (Years)

Of all our patients, 33.6% refuse first-line larval treatment. Of these, 77.7% accept this treatment when prescribed by their doctor and 22.3% refuse this type of treatment even if it is prescribed by the attending physician. Of these 22.3%, almost all patients (99.8%) accept maggot therapy when it represents the last therapeutic alternative.

During our survey, 103 prescribing physicians were interviewed in various hospital settings (University Hospital Centers (CHU), Regional Hospital Centers (RHC), private sector doctors). Of the prescribing physicians surveyed, 58% are general practitioners, 40% are specialists and 2% are university doctors. Only 25% of the prescribers surveyed know about maggot therapy. Figure 3 shows the knowledge of the maggot therapy according to the status of the prescriber.

Our survey also reveals that of the 103 prescribing physicians surveyed, 95.1% are willing to prescribe maggot therapy for their patients. It is the specialist physicians who make up the vast majority (53.1%). Figure 4 shows the acceptability of prescription of maggot therapy according to the status of the physician. Of the prescribers favoring Larvalotherapy, 81.5% of the doctors are ready to prescribe it only as therapeutic alternatives and 18.5% of the prescribers accept it routinely in clinical practice.

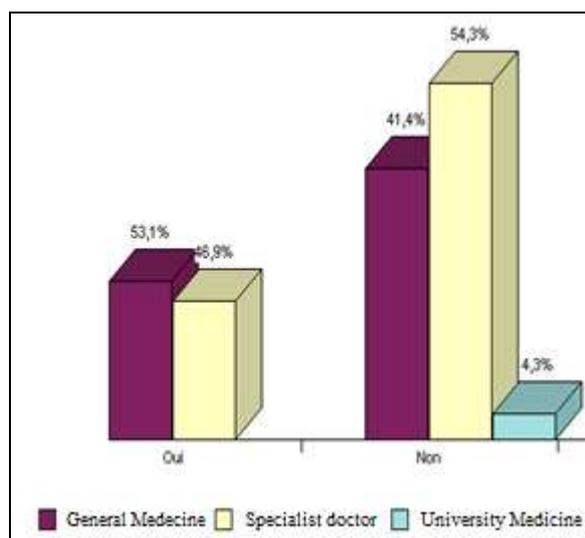


Figure 3: Knowledge according to the status of the prescriber.

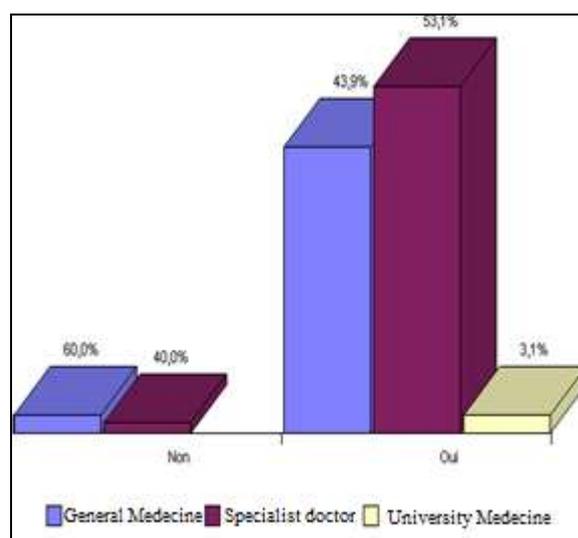


Figure 4: Acceptance of prescription of the maggot therapy according to the status of the prescriber.

DISCUSSION

Our results are very similar and almost superimposable to those of an observational study at the Dermatology Department of the R. Picqué Army Teaching Hospital, Bordeaux, led by Professor Pascal Toussaint through retrospective questionnaires. To evaluate the initial perception of the maggot therapy. According to this study, 86% of patients immediately accept treatment with maggot therapy, compared to only 14% who refuse it.^[9] Our study also reveals that 66.5% of Moroccan patients accept treatment with maggot therapy with a sex

ratio of 2.19. The 25-35 age group represents 53.1% of this population. This shows that the young and male population is the most courageous for this type of treatment. The majority of patients who initially refused larval treatment eventually accept it if prescribed by their attending physician. Almost all patients (99.8%) accept it if it is the last therapeutic alternative. This shows the primary role of prescribing physicians in explaining to Moroccan patients the benefit of this technique because of its effectiveness and the absence of significant adverse effects.^[10]

The study showed that 75% of Moroccan prescribers did not know about maggot therapy. Specialist doctors are the most concerned with a rate that exceeds 50%. The lack of this technique in current therapeutic practices and the lack of continuous training are all factors that prevent the development of larval therapy in Morocco.

The emergence of the phenomenon of bacterial resistance in Morocco^[11] is probably the major factor that pushes the majority of Moroccan prescribers to accept this type of treatment for their patients. Indeed, after a presentation of the benefits of this type of treatment to prescribing physicians, 95% agree to handle it and prescribe it. The vast majority of physicians (81.5%) accept larval treatment as an alternative to conventional treatments because of an increase in the therapeutic impasse due to bacterial resistance and particularly the diabetic foot superinfected by stage-resistant germs. amputation.

The study revealed that 94% of Moroccan prescribing doctors are ready to convince their patients to withdraw and 91% agree to advise their fellow prescribers. These positive data are favorable to the introduction of maggot therapy into the therapeutic arsenal in Morocco.

The relationship Patients / Prescribers plays an undeniable role for the success of the re-emergence of this ancestral technique. According to Professor Pascal Toussaint's study, all the patients subjected to this type of treatment are ready to repeat this technique in case of new ulcers.^[9]

CONCLUSION

Larval therapy, ancestral technique, has been abandoned in favor of antibiotic therapy. This technique for which there are few benefit / cost studies deserves to be known, since it allows, in particular indications, to ensure rapid, selective debridement and with a satisfactory management of the pain.

Today this technique must be reintegrated into the therapeutic arsenal because of their incredible effectiveness in the management of several pathologies such as diabetic foot and multi-resistant infections.

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