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Maggot Therapy: Harnessing the Healing Power of Larvae in Wound Care

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ABSTRACT

Maggot therapy being an ancient concept integrated into modern medicine. Its medical applications are of great importance especially in this era when antimicrobial drug resistance is building up greatly. Its importance is growing day by day due to its antimicrobial, necrotic tissue removal and healing characteristics.

Introduction:

Maggot Therapy (MT) is a kind of biomedical procedure involving introduction of fly larvae at chronic wound sites such as in diabetic foot ulcers and osteomyelitis in horses which do not have excellent prognosis (1). It causes debridement and disinfection of necrotic tissue and also promotes healing simultaneously. The enzymatic secretions and mechanical digestion of larvae at wound sites also perform an antimicrobial role and prevents infection from various bacterial species.

History

Its earliest known use date back as far as 1500 BC by Mayan Civilization. It was also used in 1500s by Military medical personals extensively. But its proper introduction into medicine was done by a military surgeon William S. Baer who observed the faster paced healing of wounds infected with maggots in World War 1 in 1931 (2). It became unpopular in 1940s due to discovery and increase in use of penicillin and other antimicrobial drugs. But in 1990s it came in trend due to increase in antibacterial resistance build up. In 2004 it was declared as a medical device by FDA.

Maggots

A maggot is larvae of a fly, in case of MT larvae of *Lucilia sericata* commonly known as Green Bottle Fly or *Protophormia terraenovae* commonly known as Blue Bottle Fly belonging to Calliphoridae due to their digestive secretions and their mechanical digestive nature of feeding on dead necrotic tissue. These maggots are not ordinary maggots found naturally in environment but are specially lab grown and disinfected to be used for medical purposes. These maggots are enclosed in a dressing and put onto wound for weeks depending upon the extent of wound. The side effects from maggot therapy are very rare and are generally only bad odour and slight inconvenience (3).

Clinical applications

Maggot therapy has shown a huge prospect in its role as an anti-Microbial agent against gram positive bacteria *Streptococcus pyogenes*, *Staphylococcus aureus* and gram-negative bacteria *Pseudomonas aeruginosa* are mostly responsible for delayed healing and infection in both acute and chronic wounds. *S. pyogenes* is also responsible for suppurative infections (4).

It was observed that larvae of *L. sericata* have the highest effects on *P. aeruginosa* and had the least effect on the growth of *Enterococcus spp.* Also, the research studies have demonstrated that larvae of *L. sericat*a therapy can also improve wound healing rate (5, 6).

L. sericata also possesses antifungal properties. Research studies have shown that *L. sericata* appears to possess a highly heat-stable, freeze/thaw, and lyophilization-resistant antifungal component (7).

Conclusion

MT appears to have very excellent results in chronic wound healing and antimicrobial action against MDR bacteria and can be a very good alternative to antibiotic therapy against MSRA.

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