Anti tuberculosis drug encapsulated using PLGA and Alginate-PLGA as local treatment of spondylitis TB: an in vitro study

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INTRODUCTION:
Increasing prevalence of musculoskeletal TB is not parallel with its extreme side effects and resistance (MDR TB) of oral drugs. Experimental study regarding slow release local anti tuberculosis drugs (ATD) using PLGA and alginate encapsulation never been performed. It’s gelatization ability and non-toxic properties; making it expected to be a solution.

METHODS:
In vitro study Rifampicin (RIF), Isoniazid (INH), Pyrazinamide (PYR), Etambutol (ETH) encapsulated using PLGA and Alginate. Encapsulated ATD powder plus human plasma was put on dialyzer and baker glass; extracted on day 1, 3, 5, and 7. ATD amount analyzed using HPLC RP C18e with UV-Vis detector.

RESULTS:
Alginate and PLGA carrier model for ATD are available. Encapsulated ATD level on dialyzer and baker glass detected on day 3. Encapsulated ATD-dialyzer levels increased until day 7, so did on baker glass, although concentrations in dialyzer were higher. Encapsulated ATD levels observed on day 1, 3, 5, and 7 at similar concentration of 8300 µg/mL. Significant difference levels of encapsulated and unencapsulated group in RIF (p = 0.029), INH (p = 0.02), PYR (p = 0.02), ETH (p = 0.029), and on day 1 (p = 0.029), day 3 (p = 0.02), day 5 (p = 0.026), day 7 (p = 0.02).

![Graph](image.png)

Fig 1. The difference between unencapsulated group and encapsulated group

DISCUSSION & CONCLUSIONS:
PLGA and Alginate is available for ATD encapsulation. An increase in encapsulated ATD levels in the dialyzer on days 1 to 7 suggests that ATD with Alginate-PLGA encapsulation has a slow release property can be used as preliminary study of local TB therapy.

REFERENCES: