Do Microporous Polysaccharide Hemospheres (MPH) Enhance Surgical Site Infection In A Rat Model?
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Introduction: Hemostatic agents are commonly used to stop bleeding in a variety of surgical procedures. Depending on the type of agent used, residual material may remain at the surgical site for several days or even months, promoting foreign body reactions (1). A new hemostatic powder device, Microporous Polysaccharide Hemospheres (MPH; Medafor, Inc., Minneapolis, MN 55430, USA), may alleviate foreign body reaction due to its degradation properties. Derived entirely from plant starch, MPH has the potential to be broken down by amylase within hours of application. This study was designed to determine if MPH would enhance infection in a surgical wound, and to compare the infection rate of MPH to Gelfoam and Control.

Methods: An intra-abdominal incision was placed in 120 Wister Outbred Rats and the study wounds were contaminated with Escherichia coli (2). The study wounds were randomly treated with Control (n=40), MPH (n=40) or Gelfoam (n=40) and closed with one 4-0 VICRYL suture. Following a 72-hour survival, the animals were sacrificed and a tissue sample of the study wound was dissected and cultured for E. coli growth. Colony forming units per gram of tissue (cfu/g) were calculated for each animal and compared between groups.

Results: A homogenate culture of the tissue revealed no difference between the Control and MPH groups, but a significant difference between the Gelfoam group and the Control and/or MPH groups. Clinical infection was defined as having greater than 1.0x10^5 cfu/g. When comparing groups, Gelfoam had 87% clinical infection, whereas Control and MPH had 14% and 24%, respectively.

Conclusion: In this rat infection model, using E. coli as an inoculum, MPH does not increase infection when used as a hemostat for surgical wounds compared to Control. Gelfoam, a frequently used hemostatic agent, significantly enhances infection when compared to MPH and/or Control. Because hemostatic agents can be potentiators of infections, this study suggests that MPH would be beneficial during surgical procedures where risk of bacterial infection exists.

References:
2. Kaiser AB, Kernodle DS: Low-inoculum model of surgical wound infection. JID. 1992;166:393-96