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Intradermal trivalent influenza vaccine with and without imiquimod in hemodialysis patients

Sara Abolghasemi, Shabnam Tehrani and **Zahra Doosti**
Shahid Beheshti University of Medical Sciences, Iran

Background: Considering heavy economic burden of influenza, various efforts have been done for better prevention and different vaccination methods employed for expediting immune response. Up to our knowledge, no study has been conducted in patients undergoing routine hemodialysis, so the goal of this study is to evaluate difference between the immunogenicity caused by two different routes of influenza vaccine injection (i.e. intradermal versus intramuscular), and evaluating whether pretreatment with imiquimod could augment and expedite the immune response.

Method: In this prospective randomized, double blind, controlled trial, 120 patents undergoing routine hemodialysis (i.e. for more than 1 month, at least 2 times a week) entered the study and randomly assigned into 3 groups: one experimental, and two controls. For the experimental group (INT-I), 250 mg imiquimod 5% cream (Aldara) was rubbed on deltoid region of right arm, and after 15 minutes, 0.25 cc of trivalent influenza vaccine was injected intradermal. The individuals in the first control group (INT-A), received 0.25 cc trivalent influenza vaccine via intradermal route after rubbing 250 mg aqueous cream in the same region with the same prior interval. For the second control group (IM-A), 0.5 cc trivalent influenza vaccine was injected intramuscular after using 250 mg aqueous topical cream on the same area. The immunogenicity was then measured by serum antibody titers using hemagglutination-inhibition (HI) assays, against two influenza strains: A (H1N1) and B. For comparing antibody titers two blood samples were obtained: the first immediately before and the second 14-21 days after vaccination. The increase in antibody levels against each strain then analyzed for significance.

Results: Among initial 120 participants, 117 persons completed the study. The antibody titers before and after vaccination were measured by hemagglutination inhibition assay. Both increase in antibody titers and means of the antibody increases in intradermal with imiquimod cream (INT-I), intradermal with placebo (INT-A) and intramuscular group (IM-A) were determined. Then the differences between the mean titers of INT-A and IM groups and between INT-I and INT-A groups were analyzed by covariance method (Acova). This study revealed significant response among strain A (H1N1) in intramuscular group (IM-A) comparing with the intradermal with aquas cream (INT-A) (P, 0.05). The subsequent immunogenicity in other groups and for different strains did not show any significant difference (i.e. INTA and IM-A for B strain and INT-A and INT-I for both A and B strains).

Conclusion: Although some previous studies among elderly and healthy people showed intradermal route of influenza vaccination more efficacious comparing with intramuscular route, and imiquimod pretreatment expediting and augmenting the subsequent immunogenicity comparing with non-imiquimod pretreated people, this study did not reveal the superiority of intradermal injection over intramuscular route, and also the benefit of imiquimod as premedication. Finally, regarding the acceptable immunogenicity among individuals in intradermal groups (both INT-I and INT-A), we conclude that intradermal route would be an alternative for intramuscular injections.

Speaker Biography

Sara Abolghasemi is an Infectious Diseases Specialist and completed her Fellowship of Infectious Diseases in Immunocompromised patients from Shahd Beheshti University of Medical Sciences, Tehran. She has published few papers about infectious diseases in ISI and PubMed journals and is currently working as an Assistant Professor in Shahid Beheshti University of Medical Sciences.

e: sara.abolghasemi1@gmail.com

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