

**IMMUNE RESPONSE TO INFLUENZA VACCINE IN  
HEMODIALYZED PATIENTS – ANALYSIS OF HEMAGGLUTININ  
ANTIBODY TITERS (H1,H3,HB)**

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Influenza vaccinations are recommended for many groups of patients with chronic diseases, including chronic renal failure. Immunological responses in patients with chronic renal failure treated with hemodialysis could probably be weaker than in healthy people. The aim of this study was to assess humoral response to influenza vaccine in 71 chronic hemodialyzed patients (group A), who received inactivated subunit vaccine (Arippal, Novartis) in the epidemic season 2009/2010. Control groups were: 39 hemodialyzed patients who were not vaccinated (group B) and 63 healthy adults who received the vaccine (group C). Antibody levels to hemagglutinin antigens were measured before vaccination and after 1 month by hemagglutinin inhibition test performed with influenza strains included into the vaccine recommended for the season 2009/2010 along with turkey red blood cells. Antihemagglutinin antibody titers were significantly higher after vaccination than before in group A and C. The geometric mean titer (GMT) increased from 1.75 to 13.74 for antigen H1, from 4.09 to 53.46 for antigen H3 and from 2.83 to 39.25 for antigen HB in group A. GMT in group C increased from 1.95 to 38.01 for antigen H1, from 4.75 to 61.89 for antigen H3 and from 2.88 to 30.05 for antigen HB. The mean fold increase (MFI) of anti-HA antibody levels after vaccination amounted to 7.86 for antigen H1, 13.07 for antigen H3 and 13.85 for antigen HB in group A. MFI in group C amounted to 19.47 for antigen H1, 13.04 for antigen H3 and 10.45 for antigen HB. MFI in group B (not vaccinated) amounted to 1.15 for H1, 1.24 for H3 and 0.94 for HB. The protection rate (the post-vaccination percentage of patients with protective anti-HA antibody titers  $\geq 40$ ) increased from 1.41 to 39.44% for antigen H1, from 14.08 to 67.61% for antigen H3, from 7.04 to 70.42% for antigen HB in group A. The protection rate in group C increased from 0.00 to 64.79% for antigen H1, from 0.00 to 75.65 for antigen H3 and from 0.00 to 38.03% for antigen HB in group C. In group B the protection rate didn't increase significantly. The response rate (the percentage of patients with at least a 4-fold increase of anti-HA antibody titers) after vaccination amounted to 36.62% for antigen H1, 64.79% for antigen H3 and 67.61% for antigen HB in group A. The response rate in group C after vaccination amounted to 64.79% for antigen H1, 70.42% for antigen H3 and 38.03% for antigen HB. In group B the response rate amounted to: 0.00 for H1, 2.82 for H3 and 0.00 for HB. Conclusions: the study showed a significant increase in the parameters of an immune

response to influenza vaccine in both groups of vaccinated patients (group A and C), but the immune response in hemodialyzed patients is weaker than in healthy adults.