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PLASMABLASTS AND ANTIBODY RESPONSE TO HAEMOPHILUS INFLUENZAE TYPE B VACCINE IN PATIENTS WITH CHRONIC LYMPHOCYTIC LEUKEMIA

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OBJECTIVES: Bacterial infections are the most common cause of morbidity and mortality among chronic lymphocytic leukemia (CLL) patients. In some countries vaccination against encapsulated bacteria, such as *Haemphilus influenzae type B* (HIB), is recommended for this group. Vaccine effectiveness is usually measured by serum concentration by IgG anti-HIB, but the procedure requires a month interval between vaccination and antibody titers assessment. Moreover CLL patients are often started on immunoglobulin substitution therapy before antibody production is evaluated. In such a situation, it is difficult to segregate transferred from antigen-induced specific antibodies. The aim of the present study was to investigate plasmablasts and antibody response to HIB vaccine and to check if the response in plasmablasts correlates with increase of specific anti-HIB antibodies in vaccinated CLL patients.

METHODS: This study included 30 previously untreated patients with CLL and 15 healthy individuals. All individuals received HIB vaccine. The anti-HIB antibody concentration was determined by ELISA and plasmablasts (CD19+ CD38+++IgM-) were analyzed using flow cytometry method. A response to vaccination was defined as 2-fold increase of anti-HIB antibody titers between repeated tests (pre-vaccination, and day 30 post-vaccination) and increase of plasmablasts (pre-vaccination, and day 7 post-vaccination) in the same patient.

RESULTS: Increase of plasmablasts and specific anti-HIB antibodies was noted in 11 CLL patients (36,67%) and all healthy persons (n=15, 100%). The percentage of plasmablasts before and after vaccination, and postvaccination anti-HIB antibodies were lower in CLL patients than in healthy individuals ($p=0.0023$, $p=0.0021$, and $p=0.0016$, respectively). There was a positive correlation between the increase of anti-HIB antibodies and the percentage of plasmablasts after the vaccination in healthy subjects ($r=0.721$, $p=0.00014$), and CLL patients ($r=0.692$, $p=0.00017$).

CONCLUSIONS: The majority of CLL patients fail to increase circulating plasmablasts following antigen challenge. Lacking response in plasmablasts correlates with lacking increase of specific anti-HIB antibodies in vaccinated individuals. Assessment of the differences in the amount of plasmablasts prior and after vaccination provides a rapid screening test to demonstrate defective antibody responses in CLL patients, even when on replacement immunoglobulin therapy.