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Detection of Anti-Ganglioside Antibodies in Guillain-Barre Syndrome

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Letter to the Editor

Detection of Autoantibodies against Gangliosides in Guillain-Barré Syndrome

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TO THE EDITOR

We read with great interest the article by Bonyadi and colleagues about the sensitivity and specificity of ELISA and immunoblotting for detection of anti-ganglioside antibodies in children with Guillain-Barré syndrome (GBS), which demonstrated that both sensitivity and specificity of immunoblotting were higher than those of ELISA. Their report appears intriguing because such findings may be of socioeconomic significance in reducing diagnostic costs of GBS (1). However, we have some concerns about the interpretation of their data. GBS is currently defined as an organ-specific immune-mediated disorder resulting from a synergistic interaction between cellular- and humoral- immune responses to incompletely characterized antigens in the peripheral nervous system (2). GBS consists of different clinical subtypes, including acute inflammatory demyelinating polyradiculoneuropathy (AIDP), the prototyte of GBS, which accounts for 90% of all GBS cases in the western world, acute motor axonal neuropathy (AMAN) and acute motor and sensory axonal neuropathy (AMSAN), which are more prevalent in Asia, South and Central America and are often preceded by *Campylobacter jejuni* infection, and Miller-Fisher syndrome, etc (3). Multiple lines of evidence point to a close association between the axonal variants of GBS, i.e. AMAN and AMSAN and specific anti-ganglioside antibodies (4-6). Serological investigations using a panel of gangliosides have revealed antibodies, predominantly IgG class against at least one ganglioside in approximately 60% of the acute-phase GBS sera (7, 8). Although the exact role of anti-ganglioside antibodies in the pathogenesis has not been fully understood, their detection, especially identification of subtypes of anti-ganglioside antibodies (GM1, GM2, GM3, GD1a, GD1b, GT1b, and GQ1b) may be of help in differentiating different subtype of GBS (9). Both ELISA and immunoblotting can be utilized to detect anti-ganglioside antibodies in sera. As with many other methods, sensitivity and specificity of either immunoblotting or ELISA are not 100%. In this context, a comparison study involving both the sensitivity and specificity of ELISA and immunoblotting can warrant their future use. In 16 of GBS patients (32%) and in 1 control (3.3%), anti-ganglioside antibodies (IgG) were found positive by ELISA, and in 28 of GBS patients (56%) and none of the control group were found positive by immunoblotting technique (1).

Since anti-ganglioside antibodies cannot be found in all patients with GBS (7,8), the absolute sensitivity and specificity are unavailable. A false positive may exist in anti-ganglioside antibodies positive cases detected by ELISA and immunoblotting, and a false negative in negative cases by these methods. In this regard, it seems reasonable to calculate the relative sensitivity and specificity of ELISA as compared with those of immunoblotting, or vice versa. Alternatively, more sensitive and specific methods can be employed as controls to compare the sensitivity and specificity of ELISA and immunoblotting.

In summary, identification of anti-ganglioside antibodies, particularly their subtypes in GBS is of clinical as well as socioeconomic significance, although more sensitive and specific methods remain to be explored.

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Letter to the Editor

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TO THE EDITOR

I read the recent publication on detection of anti-ganglioside antibodies in guillain-barre syndrome with a great interest (1). Bonyadi et al. concluded that immunoblotting had a better diagnostic property than ELISA and has a lower cost (1). I would like to discuss on this work. First, the sample size in this work is rather small and the diagnostic value in a large population might be different. Second, the complete cost identification is not demonstrated. Complete cost identification on both direct and indirect costs has to be shown before reaching a conclusion. In addition, cost-effectiveness comparison should also be done since it provides useful information to support the conclusion. Third, whether immunoblotting is faster than ELISA has to be clarified. The required time for each period including sample preparation has to be clarified.

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Response to the Letters by Hong-Liang Zhang and Viroj Wiwanitkit

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Dear Editor,

I would like to express my sincere appreciation to the comments received from Dr Zhang and Dr Wiwanitkit on our article published in the June 2010 issue of IJI. In this regard, I would like to bring several points to your attention. We agree with the comments concerning the number of studied cases in our article. Since the number of children with GBS is not as high as other patients and collecting samples from children is always more complicated, only GBS patients admitted to the Children Hospital of Tabriz during the study period, were included in this study. Concerning the limitations it still seems that sample size included in this study (50 GBS cases and 30 controls) was logical and high enough to consider the findings noteworthy (1).
Concerning the cost-effectiveness of the immunoblotting, there are multi panels of anti-ganglioside antibodies commercially available (2), for example, 7 panels of antibodies may be used to detect all antibodies at the same time and could be ordered with a lower cost compared to ELISA kits. The time taken by immunoblotting for detecting all antibodies is just 3 hrs in one day, but this time for ELISA method can be about 6 days, 3 hrs per day. For detection of a panel of 7 anti-ganglioside antibodies, every ELISA kit should be used separately and therefore will be more expensive than immunoblotting panel. Therefore, although immunoblotting method is not of absolute sensitivity and specificity, it would be faster, cheaper and more reliable than ELISA.

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(Autoimmunity).