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LETTER TO THE EDITOR

Monitorization of chemotherapy response using diffusion-weighted imaging in neuroblastoma

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Dear Editor,

We read with great interest the original article entitled "Variations in apparent diffusion coefficient values following chemotherapy in pediatric neuroblastoma" by Demir et al. (1) in the March 2015 issue of the *Diagnostic and Interventional Radiology*. In this article the authors aimed to compare the changes in apparent diffusion coefficient (ADC) values and volumes of neuroblastomas in 15 children before and over the course of chemotherapy. They hypothesized that any changes in ADC values due to chemotherapy could be used as a noninvasive indicator of tumor response. The mean interval for ADC measurements was 4.8 months (range, 4–8 months). The median ADC values before and after the chemotherapy were 0.74×10^{-3} mm^2/s and 1.05×10^{-3} mm^2/s, respectively. The mean volume of all lesions was decreased by 88%, with all but one lesion demonstrating significant volume reduction after chemotherapy. The same lesion revealed only a slight increase in ADC following treatment. Although they demonstrated decrease in tumor volume and increase in ADC values, they could not find a significant correlation between the tumor volume and the ADC changes. In addition, they could not show a significant correlation between the ADC values of the lesions after chemotherapy and their cellularity after surgical removal. The authors concluded that the increase in ADC values after chemotherapy appeared to be proportional with chemotherapy-induced histopathologic changes (1).

We wish to share our experience regarding the role of diffusion-weighted imaging (DWI) in neuroblastoma patients. First, we also use visual assessment of the mass lesions on isotropic *b* images and ADC maps in our clinical practice (2–4). Similar to other malignancies, neuroblastomas have variable degree of hyperintensity on isotropic diffusion images. Corresponding ADC maps reveal low signal intensity suggesting restriction of diffusion (2, 3). Following chemotherapy ADC map shows an increase in tumor signal intensity probably due to cell death. We can appreciate this aspect from the authors' Fig. 2 in their article (1), in which ADC maps reveal hyperintensity secondary to tumor response to chemotherapy. Second, it is known that DWI and ADC measurements can document the tumor response before the chemotherapy-related size reduction. In our opinion, the aforementioned follow-up intervals appear relatively long for the observation of early ADC changes. Due to the relatively long interval between the follow-up scans, they could not demonstrate the chemotherapy-induced ADC changes during the early course of the therapy. Therefore, we believe that DWI follow-ups should have been performed more frequently than the mean interval of 4.8 months (i.e., at one to two months) to show any changes in ADC before the decrease in tumor size. If DWI could show the change in ADC before the change in tumor volume, then it could be used as a valuable marker in chemotherapy response without waiting for longer periods. This could help the oncologists modify their management at an earlier period.

Conflict of interest disclosure

The authors declared no conflicts of interest.

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Author's reply

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Dear Editor,

We read the comments of Dr. Kocaoğlu and Dr. Bulakbaşı on our recently published article "Variations in apparent diffusion coefficient values following chemotherapy in pediatric neuroblastoma" (1). We would like to thank them for their valuable comments and sharing their experiences. We agree with their views about the assesment of mass lesions with diffusion weighted imaging (DWI). The relatively long interval (mean, 4.8 months; range, 4–8 months) may be the reason why we could not show a significant correlation between the change of apparent diffusion coefficient values and the volume loss of the tumor and their cellularity after surgical removal. However, our study was a retrospective one, including pediatric abdominal neuroblastoma cases who underwent MRI before and after chemotherapy. The timing of scans was determined by our pediatric oncology department. We will definitely share the comments of the authors and their contribution to the literature (2, 3) with pediatric oncologists in our institution, and ask their opinion about performing DWI follow-ups more frequently to facilitate early response assessment to chemotherapy.

Conflict of interest disclosure

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