

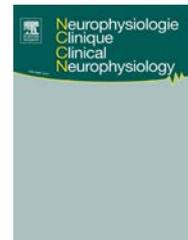


Disponible en ligne sur

ScienceDirect
www.sciencedirect.com

Elsevier Masson France

EM|consulte
www.em-consulte.com/en



SHORT COMMUNICATION/COMMUNICATION BRÈVE

Startle and blink reflex in high functioning autism



Sursaut et réflexe de clignement dans l'autisme de haut niveau

Ozdem Erturk^{a,*}, Baris Korkmaz^a, Gulce Alev^b,
Veysi Demirbilek^a, Meral Kiziltan^a

^a Department of neurology, Cerrahpasa faculty of medicine, Istanbul university, 34098 KMPasa, Fatih, Istanbul, Turkey

^b Institute of health sciences, speech and language therapy, Anadolu university, Eskisehir, Turkey

Received 21 November 2015; accepted 10 February 2016

Available online 17 March 2016

KEYWORDS

Autism;
Blink reflex;
Startle reflex

MOTS CLÉS

Autism ;
Réflexe de
clignement ;
Réflexe de sursaut

Summary An important clinical feature of autism is the presence of atypical responses to sensory stimuli. In this study, we investigated if high functioning autistic patients had abnormalities in the blink reflex and the startle reaction to auditory or somatosensory stimuli. Fourteen patients aged between 7 and 16 years were included in the study. We found a longer latency of the blink reflex, an increased duration and amplitude of the auditory startle reaction and a lower presence rate of the somatosensorial startle reaction in autistic patients. To better define the sensorial characteristics of the disease could improve the therapeutic management of children with autism spectrum disorder.

© 2016 Elsevier Masson SAS. All rights reserved.

Résumé Une importante caractéristique clinique de l'autisme est l'atypie de certaines réponses à des stimuli sensitifs ou sensoriels. Dans cette étude effectuée chez des patients autistes de haut niveau, nous avons exploré le réflexe de clignement et la réaction de sursaut à des stimuli auditifs ou somatosensoriels. Quatorze patients âgés de 7 à 16 ans ont été inclus. Nous avons trouvé un allongement de la latence du réflexe de clignement, une augmentation de la durée et de l'amplitude de la réaction de sursaut aux stimuli auditifs et une réduction du taux d'obtention de la réaction de sursaut aux stimuli somatosensoriels chez ces patients autistes. Le fait de mieux définir les caractéristiques sensorielles de la maladie pourrait améliorer la prise en charge thérapeutique des enfants souffrant d'un trouble du spectre autistique.

© 2016 Elsevier Masson SAS. Tous droits réservés.

* Corresponding author.

E-mail address: ozdemerturk@yahoo.com (O. Erturk).

Introduction

An atypical response to sensory stimuli is an important clinical feature of autism, and is included in the recent DSM V as one of the diagnostic criteria for autism spectrum disorders (ASD) [8]. It can manifest as hypo- or hyper-reactivity to any or all kinds of sensory modalities, the most common being auditory. The modality and degree of atypical responses vary amongst patients. The atypical sensory reactions such as overreaction to sounds or light touch may interfere with the learning and communication process of these children. Therefore, it is important to take this into consideration in the therapeutic management of ASD.

The causative mechanism of these atypical sensory reactions is not fully understood. It may be due to defects at the level of peripheral sensory receptors, or to conduction problems from the receptors to the cortex, or defects associated with attention, memory and perception [14]. Cortical regions, particularly prefrontal cortex, are reported to play a role in multisensory processing that also comprises sub-cortical regions, including the brainstem, cerebellum and thalamus [12].

Electrophysiological assessment of the blink reflex (BR) is a standard method that is commonly used for the evaluation of brainstem function. Auditory startle reflex (ASR) is a brainstem reflex which is elicited by auditory stimuli and recorded mainly from the facial and neck muscles, as well as the whole body. Startle reflex can also be obtained through somatosensory stimuli (SSR) [1]. Brainstem circuits play a role in both responses. The central structure involved in the reflex is the caudal reticular nucleus in the pons [7].

Considering the presence of atypical sensory reactions in combination with possible brainstem pathology in ASD, we investigated abnormalities in BR and startle reaction in a group of high functioning autistic patients. The startle reaction was elicited to both auditory and somatosensory stimuli (ASR, SSR) to study the respective effects of these different modalities of stimulation.

Methods

Fourteen patients (12 males, 2 females) aged between 7 and 16 years (mean: 11.8 ± 3.5) were included in the study. The control group was consisted of 19 age- and gender-matched typically developing children. Informed consent forms were obtained from families of all participants. Diagnosis of autism was based on DSM V criteria, and symptom severity was rated using the childhood autism rating scale (CARS). To determine intelligence level, the Wechsler Intelligence Scale for Children-Revised (WISC-R) was used by a psychologist. The patients who scored between 30 and 36 on CARS and 65 on WISC-R performance score were included in the study. The mean values of WISC-R scores were 79.1 ± 22.1 for general intelligence quotient (IQ), 90.3 ± 17.7 for performance IQ, and 71.4 ± 26.7 for verbal IQ.

BR was recorded on the orbicularis oculi (OO) muscle following supraorbital nerve stimulation (OO-reflex [supraorbital]). It has three components: ipsilateral R1 and R2, and contralateral R2 (R2C). An electrical stimulus of 0.2 ms duration was delivered at an intensity of three times

that of R2 threshold. The stimulus was given randomly as five consecutive bursts with a minimum interval of 20 seconds in order to prevent habituation. The filter settings were 3 kHz high cut and 20 Hz low cut. Onset latencies of R1, R2 and R2C responses were measured and the mean values of the five responses for each parameter were calculated.

For the ASR, after determining of the hearing thresholds, the monophasic 100 μ s tone burst auditory stimulus was delivered bilaterally through earphones as 8 bursts, with an intensity of 105 dB HL and at random intervals of 2–5 minutes. The stimulus was planned to be delivered as 8 bursts; however, it was interrupted if the child could not tolerate the test regardless of the completeness of the stimuli. We increased the stimulus duration by 50 ms every 2 stimuli so as to prevent habituation. Surface EMG recordings were obtained over OO, sternocleidomastoid (SCM) and biceps brachii (BB) muscles after each stimulus. The reflex was evaluated in three parts: OO-reflex [auditory], SCM-reflex [auditory], and BB-reflex [auditory]. Latencies, durations, amplitudes and presence rates were calculated.

Somatosensory startle was recorded by stimulating the ipsilateral median nerve at the wrist. An electrical stimulus of 0.2 ms duration was delivered at an intensity of twice the level that evoked a motor response of maximum amplitude in APB. We recorded OO, SCM and BB responses to median nerve stimulation and calculated the latencies and presence rates of OO-reflex [median], SCM-reflex [median], BB-reflex [median]. The response was accepted as present if obtained with an amplitude over 50 μ V for two trials. The procedure was stopped if the child could not tolerate the test. We used a method modified from previous studies [11], since there was no standardized method for measuring SSR.

The statistical significance level was defined as $P < 0.05$.

Results

The results are summarized in Table 1.

BR: the patients had increased R2 and R2C latencies, but there was no difference for R1 latency.

ASR: four children from the study group and one child from the control group did not complete the test (8 stimulation bursts) due to intolerance. Amplitude and duration of ASR in SCM and BB were significantly increased in patients, whereas no difference was found in ASR latency between patients and controls. The presence rate of ASR in BB was higher in patients, whereas the presence rates of ASR in OO and SCM were similar in both groups.

SSR: there was no significant difference between patients and controls regarding the latencies of SSR in OO, SCM, or BB. Conversely, the presence rates of these responses in all three muscles were reduced in patients compared to controls. Amplitude and duration of the SSR were disregarded because of these low rate of present responses.

Discussion

In this study, we found prolonged R2 and R2C latencies of the BR, increased amplitude and duration of ASR in SCM and BB, and lower presence rates of SSR in children with ASD.

The R1 component of the BR is a stable response whereas the later R2 is a more unstable response. R2 may be

Download English Version:

<https://daneshyari.com/en/article/3081889>

Download Persian Version:

<https://daneshyari.com/article/3081889>

[Daneshyari.com](https://daneshyari.com)