Perceptual Visual Skills in Delayed Language Developed Children

Eman Mostafa
Sohag University Hospital, Egypt

ARTICLE INFO

Article history:
Received 19 March 2017
Accepted 27 July 2017
Available online xxxx

Keywords:
Delayed Language Development
Visual skills
ITPA

ABSTRACT

Aim: To evaluate Perceptual visual skills in delayed language developed children.

Material and methods: The relation between visual skills and language has not been rigorously examined in previous investigations. This is a case-control study which comprised of 25 preschool children with Delayed Language Development (DLD) (cases) and 25 typically developed children (control). Exclusion criteria: any neurological or visual impaired disorder. All children had undergone Intelligent Quotient (I.Q) using Stanford Binet (IV edition), Attention Deficit Hyperactivity disorder Test (ADHDT) and Illinois Test of Psycholinguistic Abilities (ITPA). The performance of cases was surprisingly superior to the performance of controls in all visual skills. Moreover, it was significantly different in visual closure (P value = 0.027) and visual memory (P value = 0.005).

Conclusion: Reading disorders that may develop in children with DLD are more related to language than to visual skills. DLD has some strong perceptual skills such as visual closure and visual memory. This should be taken in consideration while planning a strategy for language therapy.

© 2017 Egyptian Society of Ear, Nose, Throat and Allied Sciences. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Perception operates on an immense amount of incoming information that greatly exceeds the brain's processing capacity. Because of this fundamental limitation, the ability to suppress irrelevant information is a key determinant of perceptual efficiency. Visual perception refers to the process of organizing and interpreting visual sensory stimuli. Visual perception, as a hypothetical construct, is best known through the field of learning disabilities. A simplistic explanation expressed through education is that visual perception occurs within the brain, and the process of attributing meaning to visual stimuli. The assumption of a series of levels leading from perceptual to semantic was subsequently abandoned.

Language is critical for human communication and central to social interactions. Specific language impairment (SLI) commonly experience learning difficulties of a comparable magnitude across all scholastic domains. Feldman and Messick noted that children with SLI are at high risk for reading disorders, emphasizing that reading disorders are more related to language than to visual skills. Some children whose early delays in language and speech apparently resolve during the preschool years have reading disorders at school age, indicating that the initial delay was indicative of a fundamental, although subtle long-standing disorder.

The relation between perceptual visual skills and learning disabilities has been thoroughly investigated. Yet, the relation between visual skills and language has not been rigorously examined in previous investigations. Hence, the purpose of the present study was to evaluate visual skills such as visual reception, visual association, visual closure and visual memory in delayed language developed children.

2. Methods and patients

This is a case-control study which consists of 25 children with delayed language development (Expressive Language Impairment) (cases) and 25 typically developed children with normal receptive and expressive language abilities (control). Inclusion criteria: Age of the children ranged between 2.5 and 6 yrs (preschool) and normal receptive language abilities. Exclusion criteria: any neurological or visual impaired disorder.

The cases of this study will include only Expressive Language Impairment (ELI), who showed impaired expressive language abilities and fulfilled normal receptive language abilities. Children were...
diagnosed as ELI if they had expressive language abilities one year less than their chronological age, while their receptive quotients were within normal range. This is done to in order for children to understand the instructions of the Arabic version of the Illinois Test of Psycholinguistic Abilities (ITPA).1

- Intelligent Quotient (I.Q) using Stanford Binet (IV edition)12 to exclude mental retardation.
- Attention Deficit Hyperactivity disorder Test (ADHDT).10 Parents completed the ADHD test. ADHD was based on DSM-IV diagnostic criteria; comprised of 36 questions in three subtests related to the three core symptoms of ADHD: hyperactivity, impulsivity and inattention.

- Four subtests assessing visual perception skills of the Arabic version of the Illinois Test of Psycholinguistic Abilities (ITPA)1 was administrated to both groups. Those subtests are visual Reception, Visual Association, visual closure and visual memory. The raw scores for each subtest were used to drive scaled scores for each task.

- **Visual Reception (VR)** is the ability to “remember” by matching a current visual input against an internal image reconstructed from a similar past input. It is the ability to know that what one is looking at is either the same or different than what it was previously.

- **Visual Association (VA)** is the ability to conceptually relate visually presented stimuli.

- **The visual closure (VC)** is a complex perceptual task that provides the ability to recognize an object from a partial or limited stimulus or to form a “gestalt.” The patient with a difficulty in this area is unable to perceive the “whole-part” relationship in partially-visible stimuli.

- **Visual Sequential Memory** is utilized to test the ability to reproduce meteorically a series of stimuli presented visually. The child is shown a card with a series of geometric figures on it and is then given several chips, each containing one of these figures. The child is required to reproduce the sequence on the card from memory, using the chips. It entails an active inner search of past visual experience in the absence of a stimulus.

Statistical methods: Statistical package for social Sciences version 16 (SPSS, INC, Chicago, IL) under windows was used for data entry and data analysis. Descriptive statistics were done for continuous variables by mean, standard deviation (±SD). Student ‘r’ test were used to compare continuous variables in various groups. Pearson’s correlation used to assess the association between the different parametric data. For all tests a probability (P) value less than 0.05 was considered significant.

Approval of the ethics committee of Sohag University was obtained. A written consent to participate and to publish was taken from all patients or participants before our study procedures. None of the authors have any competing interests.

### 3. Results

Both patients’ group and control group were matched as regards sex distribution and age Table 1.

The performance of cases was surprisingly superior to the performance of controls in all visual skills. Moreover, it was significantly different in visual closure (P value = 0.027) and visual memory (P value = 0.005) Table 2.

Using Pearson correlation coefficient to investigate the correlation between the visual perceptual skills and ADHDT scores, results showed no correlation. Moreover, no correlation was found between visual perceptual skills and IQ (Table 3).

No correlation was noticed between perceptual visual skills and age except visual memory which showed significant strong positive correlation (r = 0.7) (see Table 4).

### 4. Discussion

In this study, both groups had comparable results in VR and VA. However, DLD children performed significantly better in VM and VC than typically developed children with normal language abilities. One difficulty with the Visual Sequential Memory subtest is that its administration is somewhat complicated. Since tachistoscopic presentation of stimuli with supposedly 6 s exposure time, the stimuli were accurately perceived by DLD children when the duration of exposure is increased. Consequently, the superiority of DLD children in visual memory may be attributable to lengthy duration of exposure. On the other hand, visual sequential memory subtest also appears to engender low child interest and enthusiasm as well as low tester enthusiasm.16 This may explain low performance of control than cases.

DLD children performed better in Visual closure (VC) than typically developed children. VC helps us quickly to process information in our environment because our visual system does not have to analyze every detail. This skill requires an abstract problem solving and t is closely linked with thinking and development of concepts and develops later than some of the other perceptual skills. Also, Visual closure influences learning especially reading. The

### Table 1

Characteristics of the study group.

<table>
<thead>
<tr>
<th></th>
<th>Case</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>8(32%)</td>
<td>10(40%)</td>
</tr>
<tr>
<td>Male</td>
<td>17 (68%)</td>
<td>15 (60%)</td>
</tr>
<tr>
<td>Age (mean ± SD)</td>
<td>48.52 ± 9.9</td>
<td>49.2 ± 9.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Case</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD Q</td>
<td>-0.312</td>
<td>0.152</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>-0.262</td>
<td>0.258</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>-0.23</td>
<td>0.157</td>
</tr>
<tr>
<td>Inattention</td>
<td>-0.385</td>
<td>-0.0802</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th>VR</th>
<th>VA</th>
<th>VC</th>
<th>VM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD Q</td>
<td>-0.312</td>
<td>0.152</td>
<td>0.345</td>
<td>0.31</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>-0.262</td>
<td>0.258</td>
<td>0.354</td>
<td>0.389</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>-0.23</td>
<td>0.157</td>
<td>0.326</td>
<td>0.371</td>
</tr>
<tr>
<td>Inattention</td>
<td>-0.385</td>
<td>-0.0802</td>
<td>0.194</td>
<td>0.70</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th>VR</th>
<th>VA</th>
<th>VC</th>
<th>VM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age case group</td>
<td>-0.0577</td>
<td>-0.488</td>
<td>-0.34</td>
<td>-0.70</td>
</tr>
<tr>
<td>Age control group</td>
<td>-0.341</td>
<td>0.0558</td>
<td>0.03</td>
<td>0.32</td>
</tr>
</tbody>
</table>


Please cite this article in press as: Mostafa E. Perceptual Visual Skills in Delayed Language Developed Children. Egypt J Ear Nose Throat Allied Sci (2017). http://dx.doi.org/10.1016/j.ejenta.2017.07.005
دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات