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Prerequisite Abilities for the Use of Hypnosis for Pain Management in Children with Cognitive Impairment

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Abstract

: Children with mild to moderate intellectual disabilities may be able to use some self-report tools to provide a rating of the intensity of their pain. They can also describe pain quality with appropriate words and use adaptative strategies to cope with their painful experiences. Objective: To test the efficiency of mental imagery and autobiographical memory as they could be involved in hypnosis techniques for pain management. Study groups: 21 adolescents with intellectual disabilities, (M= 17 years-old, ages from 13 to 20 years-old), mental age (M= 6.8 years-old, ages from 3.6 to 9.6 years-old) and 10 typical children as a baseline to the autobiographical memory test (M= 6 years-old, ages from 5 to 9 years-old). Method: To test the ability to mentally represent events, children were asked to choose a picture to complete a story they had listened to. A semi-directive interview was conducted to assess autobiographical memory for comparison to typical children. Results: Children with intellectual disabilities were able to generate a mental image while listening to a story. They were able to recall autobiographical memories of events that were personal and specific. Conclusion: Children with intellectual disabilities appear able to take advantage of hypnosis for pain management. Further research should examine their ability to use these techniques in a clinical setting.

Keywords: Children, intellectual disabilities, mental imagery, autobiographical memory, hypnosis .

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Introduction

For a long time, the assessment and management of pain in people with intellectual disabilities was neglected. The first studies (1) to investigate the self-report skills of children with cognitive impairments assessed children's ability to use numerical rating scales of pain and to match cards depicting faces at different levels of pain. In a more recent study (2), children completed original and adapted versions of a 100 mm Visual Analogue Scale of pain, the Eland Color Scale (3), and the Faces Scale (4) after training for pain due to venipuncture. This indicated that children with mild impairments may be able to use some self-report tools to provide a first-hand rating of the intensity of their pain. Only one other study (5) investigated the ability of children with mild to moderate cognitive impairments to use a 100 mm Visual Analogue Scale of pain and a the Faces Pain Scale-Revised (6) to rate the pain of individuals depicted in vignettes. Children rated the pain they believed they would experience were they to experience the event in the vignettes. After ratings were provided, the children were also asked to describe the quality of the pain of each event. The children's pain ratings for both the vignettes and the pain they would feel in that situation did vary due to the cause of pain, suggesting they did distinguish between the pain events. They also provided up to nine words to describe the quality of the pain for the events, a number that is similar to that reported by typical children of a similar mental age, and the words were appropriate for the pain depicted (burning, pinching). Although the children did not rate their own pain for an actual experienced event, the results did indicate the children had some skill in rating pain, and most importantly, that they could describe pain quality.

In the area of pain coping skills in the population with intellectual disabilities, one study (7) has used the Pediatric Pain and Coping Inventory (PPCI) developed by Varni et al (8). Results show that children with intellectual disabilities more frequently sought social support as a method of coping with their

painful experiences as compared to literature studying typical children. Seeking social support when experiencing pain is not considered to be an optimal coping strategy under typical conditions. We proposed that this might be the most effective mechanism for those with intellectual disabilities, because they do not have the ability to respond effectively without assistance.

The evidence of abilities to assess and to cope with pain in children with cognitive impairment has opened questions regarding the efficiency of functions involved in hypnosis for pain management. It is now well known that hypnosis can decrease pain and stress during painful events (9,10). It is much easier for a child to enter in an hypnotic state than an adult, because of his high abilities to use imagination as an escape (11), and the hypnotic trance state is more reachable from 7 to 14 years of age. Several hypnotic techniques have been used, depending on age and developmental level of the child (12). Distraction (13) or listening to music (14) are good supports for hypnotic techniques. However, most of the techniques employed between 6 and 12 years of age (e.g. thinking of a favorite place, or favorite hobby, listening to a story) involve mental imagery and autobiographical memory.

Research regarding mental imagery in people with cognitive impairments has yielded no evidence of a deficit, although their abilities appear to be more heterogeneous (15-17). For example, imagery processing is more efficient for visual object properties than for spatial properties. Furthermore, the use of mental imagery appears to be an efficient strategy for improving recall in people with Down Syndrome (18). Autobiographical memory is the memory of personal events we have lived and it takes supports a feeling of selfness and the feeling of continuity. Near the end of the second year of life, autobiographical memory begins to store events as "events I lived" (19). This type of memory never appears to have been studied in people with intellectual disabilities.

The aim of this study was to investigate mental imagery and autobiographical memory, as they could be involved in hypnosis techniques for pain management in children with mild to moderate intellectual disabilities.

Methods

Participants were 21 adolescents with intellectual disabilities, 14 girls and 7 boys (M= 17 years-old, ages from 13 to 20 years-old), mental age (M= 6.8 years-old, ages from 3.6 to 9.6 years-old) recruited in the place, where they attended school.

A control group of typical children was recruited to provide a baseline for the autobiographical memory test. 10 children, 5 girls and 5 boys (M= 6 years-old, ages from 5 to 9 years-old) were interviewed at a leisure centre. Authorization was obtained from the management of the institutions, from the parents and from children themselves.

Procedure

The first task was to assess the ability to mentally represent and to understand two short stories. After listening to the stories, participants were asked to choose from three pictures the one which depicted the end of the story (20). For example, for Story A (a bear having a magic dream the night before a vaccination), one of the non-target pictures was ambiguous because it showed the bear in his bed, as described at the beginning of the story. In contrast, the non-ambiguous picture depicted the bear flying on his pillow at night (target picture). For Story B (the bear's friend is ill and he must call a doctor) the target picture is not ambiguous, it shows the doctor administering an

injection to the bear's friend. Children performed the task individually, and it took no more than 5 minutes.

The second task was to assess children's autobiographical memory during a semi-directed interview. Fourteen questions assessed memory for specific events (Have you been to the zoo?), four questions assessed memory for personal events (Can you remember something unpleasant that happened?) and four questions assessed flashbulb memories, memories of major events shared by a social group. Because of the cognitive impairment of participants, we focused on a current and media event.

The interview followed a guide (see table 1), however, the focus was on allowing the participant to freely express him/herself without structuring his/her responses. Before the interview, the interviewer ensured the child understood the purpose of the study, and that the questions were clear so that the child knew how to best respond with relevant information. Indices of prolixity were also calculated (the number of words divided by the number of questions). Children were individually interviewed. Interview lasted no more than 10 minutes.

Data Analysis

Data were analyzed using Statistical software. Alpha was set at $p = .05$ for determining significant differences.

Table 1. Percentages of children with intellectual disabilities and children in the control group who gave responses to autobiographical memory questions

Questions	% of children		X ² alpha
	with intellectual disabilities	of the control group	
1. Have you ever seen the sea?	100	100	<i>ns</i>
2. Where was it?	76	90	<i>ns</i>
3. With whom were you?	43.6	100	.01
4. What did you do?	43.6	100	.01
5. Did you go into the sea? What did you feel?	43.5	90	.01

6. Have you ever gone to the zoo?	72	90	<i>ns</i>
Give at least one animal's name	88	89	<i>ns</i>
Give at least three animal's name	52	44	<i>ns</i>
7. How old are you?	100	100	<i>ns</i>
8. What did you do last Christmas?	66	90	<i>ns</i>
9. Where were you?	85	30	.001
10. What did you received as gifts?	86	90	<i>ns</i>
11. Have you ever taken a trip?	76	90	<i>ns</i>
12. Where did you go?	69	67	<i>ns</i>
13. Can you tell me something that happened during the trip?	76	80	<i>ns</i>
14. Tell me what you did during the last holiday.	90	60	<i>ns</i>
15. Can you remember an unpleasant thing that happened?	57	80	<i>ns</i>
16 Can you remember a pleasant thing that happened?	38	90	.01
17. Do you know the name of the French President?	52	80	<i>ns</i>
18. Have you ever seen him?	47	60	<i>ns</i>
19. Can you remember where it was?	23	30	<i>ns</i>
20. When did he win the election?	14	20	<i>ns</i>

Story B, 90 % of the children chose the correct picture ($X^2[2]= 67,67$ $p<.001$).

Data Analysis

Data were analyzed using Statistic software. Alpha was set at $p = .05$ for determining significant differences.

Results

Mental Imagery Task

Children with intellectual disabilities performed better for Story B than Story A ($X^2[2]= 35,48$ $p<.001$). For story A, 52% were able to select the correct picture to complete the story ($X^2[2]= 16,89$ $p<.001$), while 38% chose the ambiguous picture. For

Autobiographical Memory Task

To compare the group of children with intellectual disabilities with the control group in the autobiographical memory interview, indices of prolixity were calculated. Over questions 1 to 16, there was a significant difference between the groups ($t(29)= 1,82$ $p<.05$). All children were able to give responses to the questions about personal events. Children in the control group displayed a mean index of prolixity of 13 words per question? (max: 19; min: 4). The mean indices of prolixity for children with intellectual disabilities was 9 words per question

(max: 23; min: 1). There was notable dispersion in both groups (see figure 1). However, if we look at the ability to give a response to questions about specific events, the groups only differ in the evocation of a pleasant memory.

There was no significant difference between the groups in the ability to give responses regarding

flashbulb memory questions, but they shown different indices of prolixity ($t(29) = 2,06$ $p < .05$). Nevertheless, 52% of the children with intellectual disabilities are able to give the name of the French President, while 80% of children in the control group could do so.

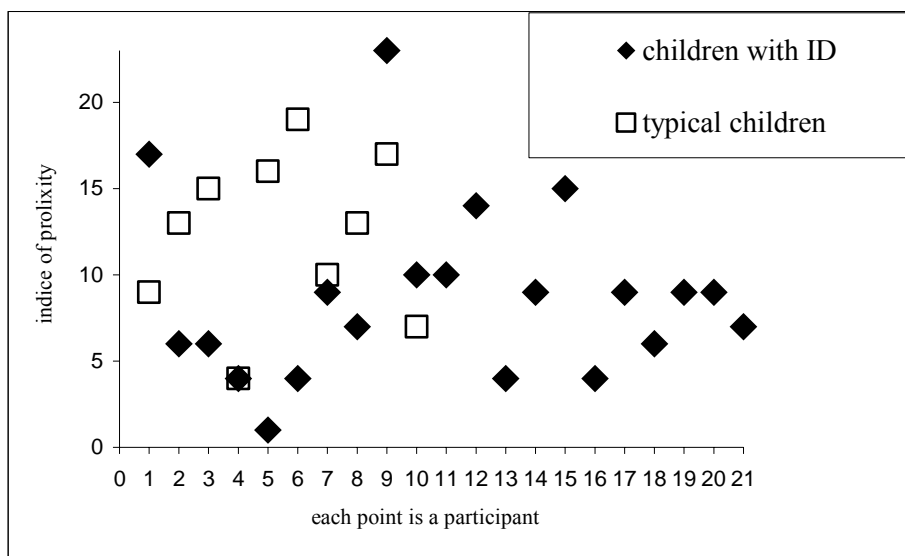


Figure 1. Indices of prolixity of children by group.

Discussion

These results show that children with intellectual disabilities were able to generate mental images regarding what was happening in a story read to them. The image seems to have been sufficiently vivid to help them to choose a picture depicting the end of the story. However, as suggested by their great difficulty with Story A, stories may have to be simple with no ambiguous nor unreal events. This appears more suited to their cognitive level.

The assessment of autobiographical memory here shows that this kind of memory may be elicited in children with intellectual disabilities. Compared to the typical children in our control group, they were able to recall personal and specific events. According to recent data (5), cognitive impairments seem to limit the prolixity of recall statements rather than the probability that an individual will recall an event. Although there was variability in the ability to respond in both groups of children, our results suggest that we can elicit recall of memories in people with

intellectual disabilities if we pay attention to the verbal level of the questions. Cognitive impairment appears to be more of an issue when precise elements of the memories are sought; with these, a difference emerges between children with and without intellectual disabilities.

There is now building evidence that children with mild to moderate intellectual disabilities are capable of reporting aspects of their pain experience and of taking some steps to cope with their pain (2,5,7). The results of this study support the idea that hypnosis has potential for pain management in this population as well as it is for young typical children. It is now necessary to test the use of hypnosis in clinical pain situations. This would provide evidence as to whether the stress caused by the pain experience attenuates the cognitive abilities and coping skills of these children, making hypnosis less effective for them as a pain management strategy.

Conclusion

We know that people with intellectual disabilities experience more pain than the general population. In spite of the growing number of studies about pain management in this population, there are yet no specific methods currently in clinical use for helping them to cope with their pain. This work suggests that mental imagery and autobiographical memories are functional, an important finding because they are involved in hypnosis for pain management. We have now good reason to develop clinical studies to investigate hypnosis as a potential pain management strategy for children with mild to moderate intellectual disabilities. This would provide caregivers and health professionals with non-pharmacological strategies that could minimize children's pain in a group where polypharmacy is frequently a concern when it comes to administering pain medications.

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