Stuttering severity and anxiety in Egyptian school-aged children

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Received 08 June 2020
Revised 11 July 2020
Accepted 26 July 2020
Published 31 March 2022

Journal of Current Medical Research and Practice
2022, 7:1–5

Context
With time, a child who stutters may change from relaxing, easy repetition to more tense and advanced stuttering, including blocks and prolongations. When the authors recommend the child to slow down, say it again, take a breath, this increases his anxiety and fear, produces more difficulties with speaking and, as a cycle it in return make more fear, anxiety, and expectation of stuttering.

Aim
The aim of the study was to assess stuttering severity and correlate it with the degree of anxiety in school-aged children who are stuttering.

Settings and design
It is a comparative study.

Patients and methods
In this study, there were two groups: The study group consisted of 50 stuttering children with age that ranged from 6 to 16 years. The control group consisted of 50 children selected from the general population who have normal fluency; they were age-matched and sex-matched with the participants in the study group.

Results
There was a highly significant positive correlation between stuttering severity and the degree of anxiety/depression problems among the stuttering group with a *P* value of 0.001.

Conclusion
There is a significant relationship between severity of stuttering and presence of anxiety among school-aged children. This result can be useful in treatment programs for children who stutter, especially in the presence of anxiety, social phobia, and depression.

Keywords:
anxiety, Egyptian children, stuttering severity, stuttering

J Curr Med Res Pract 7:1–5

2357-0121

Introduction

Stuttering is a common neurodevelopmental speech disorder characterized by repetitions, prolongations, and interruptions in the flow of speech [1].

There are many reasons to expect that stuttering may be associated with social anxiety disorder. Stuttering is associated with many negative consequences across the lifespan, which may increase exposure to social and psychological difficulties [2]. These consequences are increased during the school years. So, children and adolescents who stutter often experience peer deception, social isolation, and refuse [3,4]. The aim of this study was to assess stuttering severity and correlate it with anxiety in school-aged children who are stuttering.

Patients and methods

Ethics

Approval of the Ethics Committee of Faculty of Medicine of the Assiut University was obtained before initiating the study (IRB number 17100196).

Informed oral consent was obtained from those who were participating in the study. As the study did not include invasive maneuver, it used questionnaires, and there was no risk of participating in the study.

Study design

It is a comparative study. The children were randomly selected from the outpatient clinic of Phoniatric Unit at Assiut University Hospital for 12 months from April 2016 to April 2017.

Patients

This study was conducted in two groups:

(1) The first group consisted of 50 stuttering children (the study group), with age ranged from 6 to 16 years.

(2) The second group consisted of 50 children (control group) selected from the general population, who have normal fluency; they were sex-matched and age-matched with the children in the study group.

Individual selection criteria are:

(1) Inclusion criteria:
(a) Age: from 6 to 16 years.
(b) Sex: both sexes were included in the study.
(2) Exclusion criteria:
(a) Intelligence quotient less than 85.
(b) Presence of other speech, language, or physical disorders.

Methods

Protocol of assessment for individuals

According to Kotby *et al.* [5], the following steps were applied to each participant:

(1) Elementary diagnostic procedures:
   (a) Patient's interview (personal history and complaint).
   (b) Auditory perceptual assessment of spontaneous and automatic speech.
   (c)Visual assessment (eye contact, involuntary movements, and ENT examination).

(2) Clinical diagnostic aids:
   (a) Augmentation and documentation of auditory perceptual assessment by a digital recorder.
   (b)Formal testing:

   (i) For stuttering severity: stuttering severity Instrument-3[6] [stuttering severity index (SSI)-3 Arabic version] [7].
   (ii) For the evaluation of anxiety: the Child Behavior Checklist (CBCL), parents form was used (Arabic version) [8].
   (iii)For intelligence: Stanford Binet test (4th ed.) for children to evaluate the mentality (intelligence quotient of the child) was used [9].

Analysis and statistics

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0 (IBM Corp., Armonk, New York, USA) [10].

The Kolmogorov–Smirnov test was used to verify the normality of distribution. Qualitative data were described using numbers and percentages. Quantitative data were described using range (minimum and maximum), mean, and SD. The significance of the obtained results was judged at the 5% level. The χ^2 test was used for categorical variables, to compare between different groups. Student's *t*-test was used for normally distributed quantitative variables to compare between two studied groups. Pearson's coefficient: to correlate between two normally distributed quantitative variables. Mann–Whitney test: for abnormally distributed quantitative variables, to compare between two studied groups.

P value: level of significance:
(1) *P* greater than 0.05: nonsignificant.
(2) *P* less than or equal to 0.05: significant.
(3) *P* less than or equal to 0.01: highly significant.

Results

One hundred Egyptian school-aged children were selected to participate in this study. They have been categorized into two main groups:
(1) Study group: consists of 50 stuttering children (29 boys and 11 girls) with age ranged from 6 to 14 years and the mean age was 8.8 ± 2.66 years.
(2) Control group: consists of 50 fluent children (22 boys and 28 girls) with age ranged from 6 to 16 years and mean age of 10.7 ± 3.35 years.

On data analysis we found that:
(1) According to sex, men are more than women by 78% in the stuttering group, while women are more than men in the control group by 56%.
(2) Family history was positive in 24% in the stuttering group. The range of intelligent quotient in this group was 85–110.
(3) According to SSI-3 (Arabic version), the study group was divided into 38% who were very mild, 22% mild, 38% moderate, and 2% were very severe. The range of SSI score was 7–36, with a mean score of 21.02 ± 5 (Table 1).
(4) According to Internalizing Problems scores (Table 2), the first item, anxiety/depression was positive in 20% (10 children), borderline in 22% (11 children), and negative in 58% (29 children) of the stuttering group, while in the control group it was positive in 4% (two children),

Table 1 Distribution of stuttering severity in the stuttering group

SSI	*n* (%)
Description	
Very mild	19 (38)
Mild	11 (22)
Moderate	19 (38)
Very sever	1 (2)
Score	
Minimum-maximum	7.0-36.0
Mean±SD	21.02±5. 0

SSI, stuttering severity instrument.

borderline in 12% (six children), and negative in 84% (42 children, n = 50). This result was statistically highly significant (P = 0.010).

The second item: social withdrawal was positive in 12% (six children), borderline in 6% (three children) and negative in 82% (41 children) of the stuttering group, while in the control group it was borderline in 16% (eight children) and negative in 84% (42 children). This result was statistically significant (P = 0.016).

The third item, somatic complaint was borderline in 6% (three children) and negative in 94% (47 children) of the stuttering group, while in the control group it was negative in 100%. This result was statistically nonsignificant (P = 0.13).

Correlation between SSI score and anxiety/depression in the study group (n = 50)

In order to know the relationship between stuttering severity and the presence of social anxiety, correlations between SSI and items of internalizing problems (anxiety/depression, social withdrawal, and somatic complaints) were done. Correlation coefficients for anxiety/depression with SSI were 0.474 with a P value of 0.001 (highly significant positive correlation), but it is nonsignificant in both social withdrawal and somatic complaints. This proves the strong relationship between stuttering and anxiety (Table 3).

Correlation between SSI degree and internalized problems in the study group (n = 50)

There was a highly significant positive correlation between SSI and the presence of anxiety/depression problems among the stuttering group with a P value of 0.001, while it showed a nonsignificant correlation between SSI and presence of withdrawal and somatic complaints among the stuttering group Table 4).

Discussion

The main aim of this study was to investigate the presence of anxiety in school-aged children who are stuttering and then compared them with normal children (non-stuttering) in the same age group. The results suggested that a high percentage of the stuttering group experienced anxiety disorders more than the non-stuttering group.

The current findings in our study show an important contribution to anxiety/depression and stuttering in school-aged children. In our study, 20% of children who stutter have anxiety/depression problems and 22% of them were borderline, while they were 4 and 12%, respectively, in the non-stuttering group.

McAllister *et al.*[11] measured different forms of anxiety in 68 stutterers aged between 8 and 18 years. The results suggested that a high percentage of this client group (20.6%) experienced anxiety disorders, and this

Table 2 Distribution of internalized problems between both groups

CBCL (internalized problems)	Cases (n=50) [n (%)]	Control (n=50) [n (%)]	Test of significance	P
Anxiety/depression				
No	29 (58.0)	42 (84.0)	χ^2=9.184*	0.010*
Yes	10 (20.0)	2 (4.0)		
Borderline	11 (22.0)	6 (12.0)		
Score anxiety/depression				
Minimum-maximum	50.0-80.0	50.0-78.0	U=951.50*	0.038*
Mean±SD	61.64±9.51	58.08±7.32		
Social withdrawal				
No	41 (82.0)	42 (84.0)	χ^2=8.275*	^{MC}P=0.016*
Yes	6 (12.0)	0		
Borderline	3 (6.0)	8 (16.0)		
Score social withdrawal				
Minimum-maximum	50.0-79.0	50.0-70.0	U=1248.50	0.992
Mean±SD	59.42±8.36	58.68±6.67		
Somatic complaints				
No	47 (94.0)	50 (100.0)	χ^2=3.093	^{FE}P=0.242
Yes	0	0		
Borderline	3 (6.0)	0		
Score somatic complaints				
Minimum-maximum	50.0-70.0	50.0-65.0	U=1041.50	0.130
Mean±SD.	55.68±5.93	53.88±4.38		

χ^2, χ^2 test for comparison between the two groups; ^{MC}P: P value for Monte Carlo of χ^2 test for comparisons between the two groups; U, P: U and P values for Mann-Whitney test for comparisons between the two groups. P>0.05, nonsignificant. $P\leq$0.05, significant. $P\leq$0.01, highly significant. *Statistically significant at $P\leq$0.05.

percentage reached up to 36.4% in the 12–18-year-old group. This result is consistent with the result of our study.

Contrary to what we found in our study, Craig and Hancock[12] found that children who stutter were not any more anxious than children of a similar age who do not stutter.

Stuttering has shown to be related also to depression. In stuttering, self-reported depressive indications seem to be higher among persons who stutter than the control group [13,14]. More research clearly showed that children with anxiety disorders are at higher risk for depression and other related emotional disorders and need to be monitored [15–17].

In addition, we measured social withdrawal, in both groups, as part of internalized problems. In the study group, it was positive in 12% and borderline in 6%, while in the control group no one was positive but borderline in 16%. These results were statistically significant.

In 2013, Erickson *et al*.[18] stated that adolescents who stutter have below-average self-perceived communication competence (SPCC) (poor self-perception of communication competence has been linked to reduced interactions and social withdrawal) and heightened communication apprehension are teased and bullied more often than fluent peers, and they try to keep their stuttering secret. The SPCC scale, which is a 12-item self-report, was applied to a sample of 36 adolescents (28 men and 8 women) aged 11–18 years. More than half of the participants reported 'low' SPCC. No more than 11% of the participants reported 'high' SPCC for any of the SPCC subscales.

In addition, we found a significant relationship between anxiety and stuttering severity with correlation coefficients of 0.474 and the *P* value was 0.001 (highly significant positive correlation). This proved the strong relationship between stuttering severity and anxiety, so that as the stuttering severity increases, the anxiety appeared more.

In 2002, Craig *et al*.[19] found that the total stuttering sample in their study was shown to have higher chronic anxiety levels than people who do not stutter. This suggested that people who stutter are at risk of developing higher levels of anxiety than expected, despite their severity of stuttering or whether they have had treatment or not. People who seek treatment are likely to be more anxious, simply because they are more severe. The group who had looked for therapy were almost twice as severe in their stuttering (stuttering on almost 1 in 10 syllables) than those who had never received treatment (stuttering on almost 1 in 20 syllables), so it seems reasonable to conclude that more severe stuttering is associated with greater levels of social and psychological distress leading to higher levels of social anxiety.

Table 3 Correlation between SSI score and internalized problems (anxiety/depression, social withdrawal and somatic complaints) among children who stutter

Internalized problems	SSI		Significance
	r	*P*	
Anxiety/depressed	0.474	0.001	HS
Social withdrawal	0.155	0.284	NS
Somatic complaints	0.159	0.269	NS

HS, highly significance; *r*, Pearson's coefficient; SSI, stuttering severity index. $P>0.05$, nonsignificant. $P\leq0.05$, significant. $P\leq0.01$, highly significant.

Conclusion and recommendations

There is a significant relationship between severity of stuttering and the presence of anxiety among school-aged children. This result can be useful in

Table 4 Distribution of children who stutter according to the grades of stuttering severity index in correlation to the internalized problems present

Internalized	SSI description [*n* (%)]				χ^2	^{MC}P	Significance
	Very mild (*n*=19)	Mild (*n*=11)	Moderate (*n*=19)	Very sever (*n*=1)			
Anxiety/depression					19.347	0.001	HS
No	16 (84.2)	7 (63.6)	6 (31.6)	0			
Yes	1 (5.3)	0	9 (47.4)	0			
Borderline	2 (10.5)	4 (36.4)	4 (21.1)	1 (100.0)			
Social withdrawal					3.653	0.595	NS
No	16 (84.2)	8 (72.7)	16 (84.2)	1 (100.0)			
Yes	3 (15.8)	2 (18.2)	1 (5.3)	0			
Borderline	0	1 (9.1)	2 (10.5)	0			
Somatic complaints					2.332	0.799	NS
No	17 (89.5)	11 (100.0)	18 (94.7)	1 (100.0)			
Borderline	2 (10.5)	0	1 (5.3)	0			

^{MC}P, *P* value for Monte Carlo for χ^2 test for comparing between the two groups $P>0.05$, nonsignificant. $P\leq0.05$, significant. $P\leq0.01$, highly significant.

treatment programs with children who stutter, especially in the presence of anxiety, social phobia, and depression.

We recommend that evaluation of stuttering children should include evaluation and assessment of their psychological status regarding social anxiety or depression.

We also recommend further research to know how effective is the treatment of anxiety in children who stutter and whether this treatment will reduce stuttering in return.

Acknowledgements

The author acknowledges Professor Dr Emad Kamel Abd El-Haleem, Head of the Unit of Phoniatrics, Faculty of Medicine, Assiut University who suggested the idea of this study and Dr Eman Sayed Hassan, Professor of Phoniatrics, Faculty of Medicine, Assiut University without whose invaluable help, and continuous support provided step-by-step guidance. He also specially thank Dr Khaled Ahmed Elbeih, Professor of Psychiatry, Psychiatry and Neurology Department, Faculty of Medicine, Assiut University for supervising this study and for his kind guidance and help. Finally, he acknowledges all children who had participated in this research.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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