

An Overview about Specific Language Impairment: Review Article

Amany Abdelbaset Sabry Mohammed*, Amal Saeed Quriba, Elham Magdy Hassan, Nasser Labej Alnakeb

Department of Phoniatrics, E.N.T, Faculty of Medicine, Zagazig University, Egypt

*Corresponding author: Amany Abdelbaset Sabry Mohammed, Mobile: (+20) 01119290707, E-Mail: franshiskoo@gmail.com

ABSTRACT

Background: Children without other causes of language delay, such as deafness, intellectual disability, neurological impairment and major emotional problem, or socioeconomic disadvantage, may be affected by specific language impairment (SLI), a communication disorder. A child's language skills (including those of speaking, listening, reading, and writing) might be negatively affected by SLI.

Objective: Review of the literature on Specific language impairment.

Methods: We scoured scholarly papers and databases like PubMed, Google Scholar, and Science Direct for information on specific language disability. Only the latest or most comprehensive study between March 2000 and September 2022 was considered. The authors also analysed references from similar literature. Documents written in languages other than English have been overlooked because of a lack of funding to translate them. Unpublished articles, oral presentations, conference abstracts, and dissertations were all generally agreed upon not to constitute legitimate scientific investigation.

Conclusion: About 8% of kindergarteners have specific language impairment, making it one of the most prevalent developmental disorders. Numerous global studies show that anywhere between seven and fifteen percent of preschool and school-aged children are developing language and literacy skills at a slower rate than their classmates. Children with SLI may have auditory processing or processing difficulties due to interactions between spoken and non-verbal brain substrates.

Keywords: Specific language impairment, Children.

INTRODUCTION

Children without other causes of language delay, such as deafness, intellectual disability, neurological impairment and major emotional problem, or socioeconomic disadvantage, may be affected by specific language impairment (SLI), a communication disorder. A child's language skills (including those of speaking, listening, reading, and writing) might be negatively affected by SLI ⁽¹⁾.

Without any obvious physical disability, recognised syndrome, or other mitigating medical factors, children with what is known as a developmental language disorder (DLN) and language delay, or developmental dysphasia struggle to express themselves and understand others through spoken and written language ⁽²⁾.

About 8% of kindergarteners have this disease, making it one of the most prevalent in the population. Multiple international studies have found that between seven and fifteen percent of preschool and school-aged children have language acquisition and development rates that are different from the norm. Children with SLI are those who have trouble learning and using language, but for whom the cause is unknown. These kids have average social-emotional skills, hearing, and IQ even if they can't talk. However, these kids have a lot of problems with language, from delayed onset and slower learning of lexical and grammatical forms to smaller vocabularies to trouble with inflectional morphology and sophisticated syntax. At first, it was thought that these language difficulties were caused by a lack of grammatical skills ⁽³⁾.

There is overwhelming evidence from the scientific literature that boys are more likely to experience SLI than girls. No connection has been established to genes on sex chromosomes, hence the cause is unknown. In children

with SLI, motor difficulties are a common symptom. However, quantitative studies have identified changes in brain size or relative proportions of white or grey matter in certain regions in children with SLI, even though brain scans rarely indicate any evident abnormalities in these kids ⁽⁴⁾.

Motherhood stress and elevated testosterone levels have been linked to this occurrence. There is an elevated chance of impairments in children who have a family history of speech disorders. The percentage of children with Specific Language Impairments (SLI) is estimated to be between 3 and 6% of the population, and 7.4% of children aged five and under ⁽⁵⁾.

Causes of SLI:

- **Genetic:**

Multiple studies point to a strong genetic relationship as a possible explanation for SLI, although its exact causation remains unknown. Children with SLI are more likely to have family members who themselves have experienced speech impairments or delays. Between half and two-thirds of SLI cases in children can be traced back to a first-degree relative. There is no link between learning many languages and SLI. However, the disease is not limited to monolingual youngsters; it can also affect those who speak multiple languages ⁽⁶⁾.

According to **Starling et al.** ⁽⁷⁾, the genetic basis of this impairment is demonstrated by the higher prevalence of SLI in monozygotic than in dizygotic twins. They proved the role that genetics plays in shaping linguistic aptitude. The influence of these elements was greatest with respect to expressive abilities, and it was least with respect to passive vocabulary, which was mostly influenced by one's surroundings. They were unable to definitively identify the genetic marker as the sole cause of SLI. They supported the theory that the different

genetic causes of language deficits are influenced by the observable heterogeneity at the behavioural level.

The emergence and manifestation of SLI may be affected by a combination of genetic mutation, inherited influences, and environmental variables. Since the development is typically the consequence of intricate interactions between multiple causes, it is essential to rule out the possibility that any one of these factors acted alone to bring about the change ⁽⁸⁾.

- **Anatomical:**

There are times when peculiar brain gyri are discovered. Until now, no "neural signature" specific to SLI has been identified. Atypical patterns identified in children with SLI may overlap with those shown in children with other neurodevelopmental disorders, suggesting that differences between the brains of children with SLI and typically developing children are modest ⁽⁹⁾.

- **Auditory processing:**

Children with SLI may have auditory processing or signal processing difficulties because their speech and nonverbal processing brain substrates are interacting. There appears to be a negative effect on language due to disruptions in a fundamental neuronal timing system, but there may also be higher-level linguistic deficiencies. Children with SLI may have trouble with all aspects of language development, including the ability to produce and understand language, as well as with reading, arithmetic, written expression, and social interactions. Inadequate temporal processing of auditory information is at the root of language difficulties. This is due to problems with sound discrimination when auditory signals are delivered quickly and to difficulties with processing the temporal sequence of nonverbal auditory inputs ⁽¹⁰⁾.

Classification (subtypes) of SLI:

1. **Verbal Dyspraxia:** The commencement of speech is much delayed and severely limited with defective production of speech sounds and short utterances, understanding is acceptable, but expressiveness is limited due to irregular irregularity of phonology (inconsistency of speech sound production). Damage to the articulators' structure or nervous system is ruled out as a cause of the poor speech output ⁽¹¹⁾.
2. **Phonologic Programming deficit syndrome:** Long utterances with several phonologic processes (low speech intelligibility), but the youngster understands and expresses himself/herself fluently despite this ⁽¹²⁾.
3. **Semantic Pragmatic deficit syndrome:** Autism is distinguished from other disorders by the child's speech being fluent but unrelated to the target, their comprehension being over-literal or sometimes only responding to one or two words in a phrase, and the content of their language being odd early echolalia ⁽¹³⁾.
4. **Phonologic–Syntactic deficit syndrome:** is the most prevalent type of SLI and is characterised by that the child uses short, choppy sentences that omit

some grammatical features, the child has difficulty understanding complex utterances, the child's expression is grammatically incorrect "much phonologic processes, word finding difficulty" and the child's comprehension is variable ⁽¹¹⁾.

5. **Lexical-syntactic deficit syndrome:** The child has trouble expressing himself or herself and has trouble finding the right words. Connected speech is difficult to understand. Instead of being irregular, the syntax is juvenile (esp. verbs). Regular Phonology ⁽¹³⁾.
6. **Verbal auditory agnosia:** It is a rare form of language impairment characterised by a child's apparent inability to understand spoken language. Symptomatic of Landau-Kleffner syndrome, in most cases. EEG abnormalities and a dismal prognosis go hand in hand in many cases ⁽¹⁴⁾.

Linguistic disorder:

Late language development is a common trait among children with SLI (reaching spoken language milestones later than peers). Later than typical timing for first words and first word combinations. The vocabulary of children with SLI is typically smaller than that of their classmates. Their vocabulary is limited, and it takes them more time to master CVC syllables and multisyllabic expression ⁽¹³⁾.

Auditory processing deficits:

Deficits in processing speed, sequence and phonological memory, and other forms of memory are all symptoms of SLI in children ⁽¹³⁾.

Neuromotor disorders:

SLI is characterized by subtle neurological symptoms like clumsiness, inattention, minor motor problems, and impaired visual motor integration in children ⁽¹³⁾.

Learning disabilities:

At school age, many kids with mild to moderate SLI are reclassified as having a learning disability. Not all kids with learning disabilities had SLI when they were younger ⁽¹⁵⁾.

Symptoms of SLI tend to be very dynamic. Deficits noted in the first three years of life may be completely eradicated, greatly mitigated, or fundamentally transformed. Most kids improve their lexical skills by the time they're three, but those who are ahead or behind can still do OK. Mainly, they have to do with things like hearing, speaking, and writing. A child's linguistic abilities flourish at the age of 7, although they may still struggle with reading and writing ⁽¹⁵⁾.

Assessment of SLI:

Standardized tests of language and nonverbal abilities, as well as an interview with the child's caregiver and observation of the child in an unstructured context, are often used in the evaluation of children with SLI. Numerous examinations cover a variety of languages ⁽¹³⁾.

A- Arabic articulatory test: Speech evaluations were conducted. The test consists of a series of pictures and a list of words that describe them. Each Arabic phoneme is accompanied by three images representing words that

either begin with, contain, or end with that phoneme. The capacity to correctly pronounce phonemes in visually displayed key words was evaluated for all participants. If the phoneme was pronounced correctly on at least two separate occasions, the speaker was regarded to have acquired the skill ⁽¹⁶⁾.

B- Speech analysis: patient speech samples were evaluated for intelligibility utilising Ain Shams Assessment Protocol's auditory perceptual evaluation. Then, the speakers' voices were graded on a scale from 0 (normal) to 3 (abnormal) based on their loudness, pitch, and character as well as their supra-segmental phonology (rate, stress, and tonality), segmental phonology

(consonants and vowels), and nasal resonance of speech (severe abnormality). Examiners graded the samples of speech they heard in their entirety based on their auditory perceptual evaluations ⁽¹⁶⁾.

C- IQ testing: Using the 5th version of Stanford Binet. The average IQ of the patients was 85 ⁽¹⁷⁾.

D- Language testing: Using the Arabic version of the Fourth Edition of the Modified Preschool Language Scale (modified PLS-4). This exam calculates the individual's receptive, expressive, and cumulative language ages. All participants were at least two years old in terms of expressive language ability ⁽¹⁸⁾.

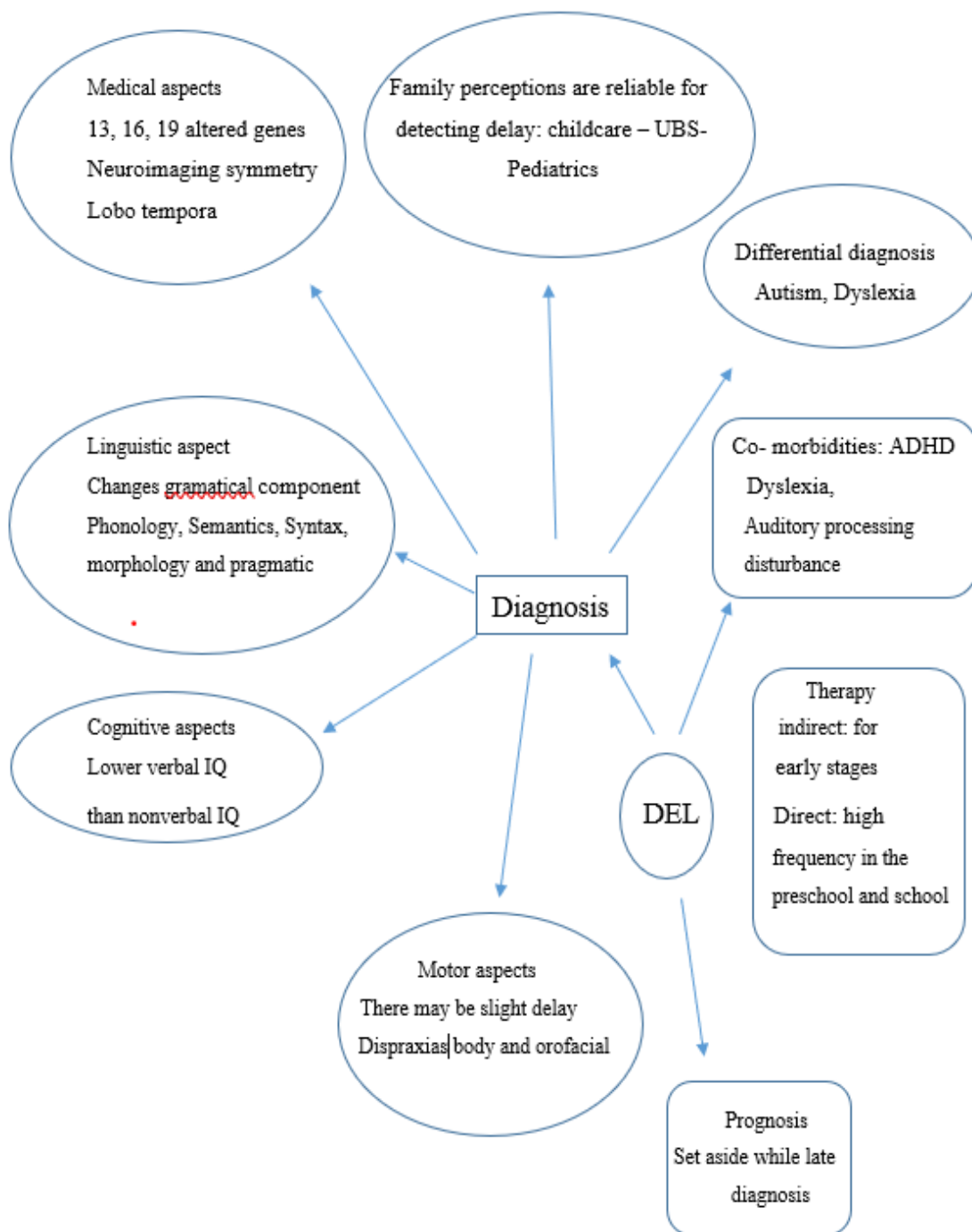


Figure (1): Summary of the research about SLI ⁽¹³⁾.

Treatment of SLI:

A phoniatician typically provides or oversees treatment services for SLI. Outpatient care can be given in a variety of settings, including private practices, community health centres, public health clinics, and hospitals. Although early diagnosis and treatment of children with SLI yields the best results, people can improve regardless of when they receive care. Treatment varies by age and severity of condition. Young children who begin treatment sooner have a better chance to:

- ❖ Learn the grammar rules that you are lacking.
- ❖ Develop their vocabulary and ability to express themselves.
- ❖ Become more adept in talking to others.

For youngsters of school age, therapy may centre on addressing difficulties with comprehending classroom instruction:

- ✓ Taking a lead and leading.
- ✓ The importance of comprehending course material.
- ✓ Classifying Data.
- ✓ Developing one's linguistic abilities.

Help with technical vocabulary or increasing workplace writing abilities may be necessary for adults transitioning into new employment, vocational programs, or further education⁽¹⁹⁾.

Prognosis:

Evidence suggests that SLI may have a role in the development of reading (and particularly reading comprehension) and writing difficulties. Because of this, it's crucial to recognise the signs of this disorder in infants and toddlers so that language, academic, and social development issues can be mitigated or avoided altogether. This necessitates a multidisciplinary effort in diagnosis and treatment, which helps put kids and their families' hopes, fears, and frustrations about schoolwork in order⁽²⁰⁾.

CONCLUSION

About 8% of kindergarteners have specific language impairment, making it one of the most prevalent developmental disorders. Numerous global studies show that anywhere between seven and fifteen percent of preschool and school-aged children are developing language and literacy skills at a slower rate than their classmates. Children with SLI may have auditory processing or processing difficulties due to interactions between spoken and nonverbal brain substrates.

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