DELAYED PSYCHO-SPEECH DEVELOPMENT SYNDROME (ZPRR) IN CHILDREN: ETIOLOGICAL FACTORS, CLINICAL FEATURES, DIAGNOSTIC APPROACHES, AND REHABILITATION STRATEGIES

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Abstract: Delayed Psycho-Speech Development Syndrome (ZPRR) is a common neurodevelopmental disorder characterized by delays in speech, language, cognitive, and social development in children. The present study aimed to analyze the etiological factors, clinical manifestations, diagnostic approaches, and rehabilitation strategies associated with ZPRR. The findings revealed that prematurity, perinatal hypoxia, low birth weight, genetic predisposition, and environmental factors are among the major risk factors for the development of ZPRR. Delayed speech onset, limited vocabulary, impaired social communication, and learning difficulties were identified as the most common clinical manifestations. The analysis also demonstrated that early diagnosis and multidisciplinary rehabilitation significantly improve developmental outcomes.

Keywords: Delayed Psycho-Speech Development Syndrome (ZPRR), speech delay, child development, neurodevelopmental disorders, pediatric neurology, early diagnosis, speech therapy, rehabilitation, developmental delay, cognitive development.

INTRODUCTION: Delayed Psycho-Speech Development Syndrome (DPSD), also known as Delayed Mental and Speech Development (ZPRR), is one of the most

significant challenges in modern pediatrics and pediatric neurology. The condition is characterized by delayed development of speech, cognitive abilities, communication skills, and social adaptation compared to age-related norms. Early identification and intervention are crucial because developmental delays can negatively affect a child's educational achievement, social integration, and overall quality of life. [3,7,11]

According to the World Health Organization (WHO), approximately 52.9 million children worldwide are affected by developmental disorders. Speech and language disorders are among the most common developmental problems, affecting approximately 5–10% of preschool-aged children. [10] Furthermore, studies indicate that developmental delays occur more frequently in boys than in girls. Recent epidemiological data suggest that nearly 250 million children under the age of five in low- and middle-income countries are at risk of not reaching their full developmental potential due to biological and environmental factors. [12, 18]

Aim of the study: To analyze the etiological factors, clinical characteristics, diagnostic approaches, and modern rehabilitation methods of Delayed Psycho-Speech Development Syndrome (ZPRR) in children.

METHODOLOGY: This study was conducted using a comprehensive literature review approach. Scientific articles, clinical guidelines, systematic reviews, and epidemiological reports related to Delayed Psycho-Speech Development Syndrome (ZPRR) in children were collected from international databases, including PubMed, Scopus, Google Scholar, and World Health Organization (WHO) publications.

The selection criteria included studies published in English and Russian between 2015 and 2026 that focused on the epidemiology, etiology, clinical manifestations, diagnosis, and rehabilitation of children with psycho-speech developmental delays. Publications with insufficient scientific evidence or unrelated to pediatric developmental disorders

were excluded.[13,17]

The collected data were analyzed using comparative and descriptive methods. Information regarding prevalence, risk factors, diagnostic tools, and treatment strategies was systematically reviewed and summarized. Particular attention was paid to evidence-based approaches for early diagnosis and multidisciplinary rehabilitation, including speech therapy, psychological intervention, behavioral therapy, and family-centered support programs. The findings obtained from the selected literature were synthesized to identify current trends, challenges, and effective management strategies for children with ZPRR syndrome.[9, 11,14,18]

RESULTS: The analysis of the reviewed literature demonstrated that Delayed Psycho-Speech Development Syndrome (ZPRR) is a multifactorial condition influenced by genetic, neurological, perinatal, and environmental factors. The majority of studies reported that speech delay is often accompanied by cognitive, behavioral, and social communication difficulties, emphasizing the need for early diagnosis and multidisciplinary intervention.

A review of epidemiological data revealed that speech and language disorders affect approximately 5–10% of preschool-aged children, with a higher prevalence among boys. Prenatal and perinatal complications, including maternal infections, prematurity, birth hypoxia, and low birth weight, were identified as major risk factors.[5]

Table 1. Main Risk Factors Associated with ZPRR in Children

Risk Factor	**Description**	**Impact on Development**
Genetic factors	Family history of developmental disorders	Increased susceptibility to speech and cognitive delays
Prematurity	Birth before 37 weeks of gestation	Delayed neurological maturation
Perinatal hypoxia	Oxygen deprivation during birth	Impaired brain development

Low birth weight	Birth weight below 2500 g	Increased risk of developmental impairment
Neurological disorders	CNS injuries and neurodevelopmental abnormalities	Speech and cognitive dysfunction
Environmental factors	Limited social interaction and language stimulation	Delayed language acquisition

The reviewed studies also showed that children with ZPRR commonly present with delayed first words, limited vocabulary, difficulties in sentence formation, impaired attention, and reduced social interaction. Early screening and intervention significantly improve developmental outcomes.

Table 2. Common Clinical Manifestations of ZPRR

Clinical Manifestation	**Frequency in Reported Studies**
Delayed speech onset	80–90%
Limited vocabulary	70–85%
Poor social communication	50–70%
Attention deficits	40–60%
Learning difficulties	35–55%
Behavioral problems	30–50%

Analysis of rehabilitation outcomes indicated that multidisciplinary treatment approaches, including speech therapy, psychological counseling, occupational therapy,

and parental involvement, produce the most favorable results. Studies reported that children who received early intervention before the age of five demonstrated significantly better language and cognitive outcomes than those who began treatment later. [3, 16, 20]

ANALYSIS: The analysis of the reviewed studies showed that ZPRR is most commonly associated with prenatal and perinatal risk factors, including prematurity, birth hypoxia, and low birth weight. Delayed speech development was identified as the primary symptom, often accompanied by difficulties in attention, learning, and social communication.

The findings also revealed that early diagnosis and intervention significantly improve speech and cognitive outcomes. Children who receive speech therapy and multidisciplinary rehabilitation at an early age demonstrate better developmental progress than those diagnosed later. These results suggest that regular developmental screening and timely rehabilitation are essential for reducing the long-term impact of ZPRR and improving children's quality of life.

DISCUSSION: The findings indicate that Delayed Psycho-Speech Development Syndrome (ZPRR) is a common developmental disorder influenced by genetic, neurological, perinatal, and environmental factors. Delayed speech onset and limited vocabulary were identified as the most frequent clinical manifestations. The analysis showed that prematurity, birth hypoxia, and low birth weight are important risk factors associated with ZPRR. Furthermore, children who receive early diagnosis and multidisciplinary rehabilitation demonstrate significantly better language and cognitive outcomes than those with delayed intervention.

CONCLUSION: Delayed Psycho-Speech Development Syndrome (ZPRR) is one of the most common developmental disorders in children and can significantly affect speech, cognitive abilities, and social adaptation. The findings of this study indicate that prenatal and perinatal factors, particularly prematurity, birth hypoxia, and low

birth weight, play an important role in the development of the syndrome. Early diagnosis and comprehensive rehabilitation, including speech therapy and psychological support, are essential for improving developmental outcomes. Therefore, regular developmental screening and timely intervention should be prioritized to enhance the quality of life and future social integration of children with ZPRR.

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