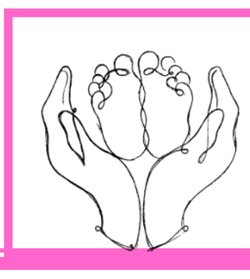
The Clinical-Care Pathway of the At-Risk Birth Line (LNaR) 0-3 years, within the Child and Adolescent Psychiatry (NPIA) services of ASL Roma 1: preliminary observational data

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Introduction

Prevention and health promotion for the unborn child in the presence of specific risk factors represent a widely documented priority in scientific literature and clinical-care practice. The "At-Risk Birth Protocol" (Linea Nascita a Rischio – LNaR) of Asl Roma 1 Child and Adolescent Psychiatry Service is dedicated to this mission. The LNaR is articulated through specific local Diagnostic Therapeutic Care Pathways, operating in full synergy with the guidelines of the Local Mental Health Plan (2025–2030) and in compliance with Agreement 15/CSR of 02/20/2020. The objective of LNaR is to monitor high-risk conditions and promote early and/or preventive intervention aimed at reducing neuropsychiatric issues in early childhood.

Methods

The core of the project lies in monitoring the cognitive, neuro-psychomotor, communicative, relational, emotional, and adaptive development of the infant through the use of standardized tools and scales, following the child across the 0 -to-3 age span (evaluations at 6, 9, 12, 18, 24, 30, 36 months) from 2019 to the present moment. Participants can be referred by primary care pediatricians or by other ASL Roma 1 services (such as Perinatal Mental Health - SaMeP, Neonatology Units, and Family Counseling Centers).

When necessary, early neuro-psychomotor and/or speech therapy interventions were implemented for specific developmental profiles.

Inclusion Criteria:

Neonatal and Perinatal Conditions: Preterm infant, SGA (Small for Gestational Age), peri - postnatal distress (include APGAR <5, asphyxia), genetic conditions, minor neurological and orthopedic conditions.

Social, Family and Parental Factors: Couples with a history of recurrent pregnancy loss and/or difficulty achieving a viable pregnancy; social distress (include maternal and/or paternal psychological distress, high-risk socio-environmental situations for the child).

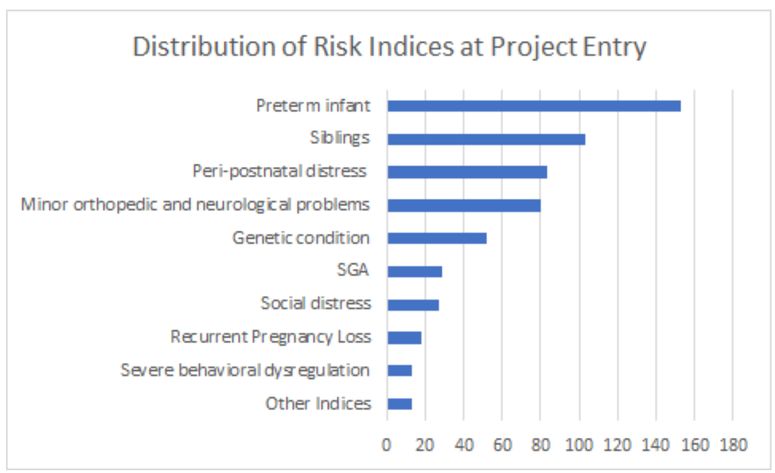


Table 1: Distribution of risk indices at project entry (total sample 571 participants)

Family History: Sibling with a diagnosis of Autism Spectrum Disorder (ASD) or other severe neurodevelopmental diagnoses.

Other conditions: severe behavioral dysregulation, parental alcool and drug addiction.

Inclusion in the Italian Network for Early Detection of Autism Spectrum Disorders (NIDA) Protocol of the Italian National Institute of Health (ISS), if one of the following three conditions is present: Siblings of ASD participants, preterm infants, and Small for Gestational Age (SGA).

Children with severe neurodegenerative diseases were excluded and followed by other services.

Materials

Clinical and Motor Assessment: Neurological examination, assessment of spontaneous motility, Neurobehavioral Assessment (Brazelton NBAS Scale).

Cognitive and Global Development: Griffiths Scales of Child Development – 3rd Edition (GMDS-3). Communication and Language: Primo Vocabolario del Bambino (PVB) [Italian version of the MacArthur-Bates CDI], Social-Conversational Skills in Children Questionnaire (ASCB). Temperament, Behavior, and Adaptive behavior: Parenting Stress Index (PSI), Italian Questionnaires for Temperament (QUIT), Child Behavior Checklist (CBCL), Vineland Adaptive Behavior Scales II (VABS-II). Specific Protocol for NIDA Participants: Modified Checklist for Autism in Toddlers (M-CHAT), First Year Inventory (FYI), Autism Diagnostic Observation Schedule (ADOS-2), Autism Diagnostic Interview-Revised (ADI-R).

Participants

A total of 571 participants (321 males and 250 females) were recruited from January 2019 to June 2026. 275 participants (152 males and 123 females) fall under the NIDA protocol. 193 participants did not complete all follow-up stages due to relocation to other residences (31), meet exclusion criteria (7) or dropout (155). To this date, 254 participants (143 males and 111 females) who reached the 36-month milestone are the main focus of this study.

Diagnosis and Conditions

Based on their assessment, the following health conditions were assigned to each participants at fist evaluation: Specific motor development delay, Delay in reaching global developmental milestones, Language development delay, Delay in attention skills, Postural alterations (including asymmetries, plagiocephaly, torticollis, clubfoot, etc.), Behavioral and temperamental regulation difficulties, Difficulties in spontaneous motility, Tone alteration (hypotonia-hypertonia), Autism risk.

Based on their assessment the following diagnosis (based on ICD-10) were assigned to each pariticipants at 36 months: Mixed specific developmental disorder, Emotional disorders with onset specific to childhood, Developmental coordination disorder, Language disorder, Attention and concentration deficit, Cerebral palsy, Autism, Psychomotor delay. "Age-appropriate profile" indicates a developmental profile appropriate to chronological age and the absence of other health conditions

Results

The mean age of entry into the project is 7.5 months (S.D. 5.2 months). Of the 254 participants who reached the 36-month milestone, 32 participants presented an age-appropriate profile at the baseline evaluation, while 222 had one of the conditions described in Table 2.

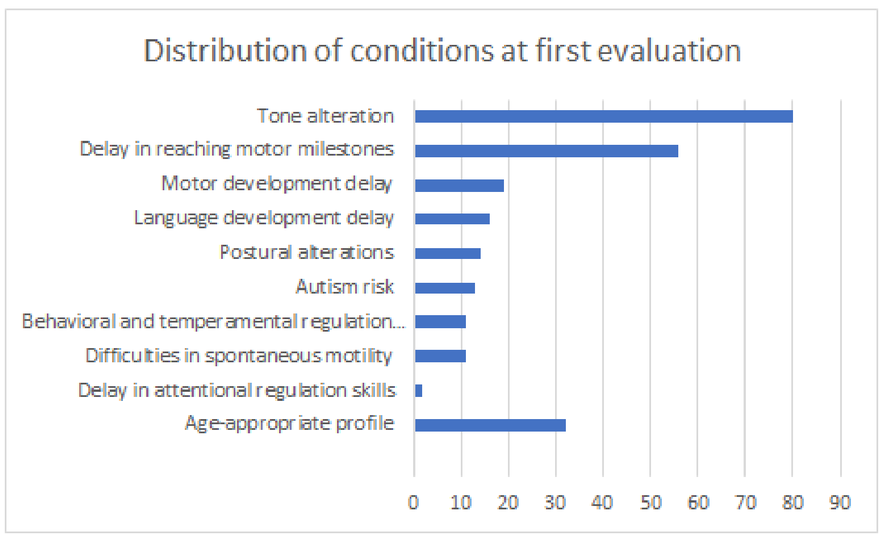


Table 2: Distribution of conditions at first evaluation (254 participants)

At 36 months, 50 participants presented an age-appropriate profile, while 204 had one of the conditions described in Table 3.

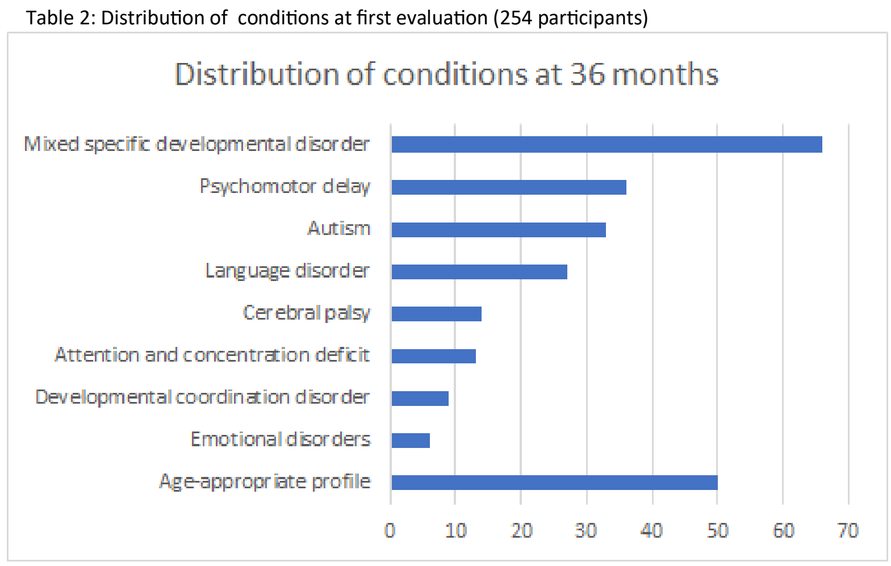


Table 3: Distribution of conditions at 36 months (254 participants)

Conclusion and discussion

The primary result reveals a positive longitudinal trend, characterized by a progressive increase over time in the number of participants achieving an age-appropriate developmental profile. Specifically, by the 36-month milestone, the proportion of children within normal limits doubled, rising from approximately one-tenth at baseline to one-fifth of the entire cohort, representing 50 out of 254 patients.

A closer analysis of this cohort yields particularly interesting insights, as 35 of these 50 patients had actually scored outside the normal range during their first clinical evaluation, with tone alterations being the most frequent early vulnerability affecting 15 participants. Following their initial assessment, 20 of these 35 children successfully shifted to within normal limits after undergoing targeted neurodevelopmental and/or speech therapy provided directly by the ASL or accredited public centers, while the remaining 15 children improved spontaneously without any direct therapeutic intervention. Ultimately, preliminary data contribute to validating the critical impact of early public intervention, showing that prompt screening and targeted therapies could significantly mitigate early developmental vulnerabilities in a portion of participants.

The main study limitations include a significant drop-out rate (~27.14% lost to follow-up), introducing potential selection bias regarding baseline characteristics. However, most of the dropouts were due to the absence of developmental concerns among parents. Furthermore, sample heterogeneity and the lack of a control group limit the ability to isolate specific intervention effects from spontaneous maturation.

Future goals include expanding follow-up into school age (4–8 years) and analyzing longitudinal data to better map the biological, genetic, environmental, and epigenetic trajectories that shape development and optimize early intervention.

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