RISK FACTORS FOR GLOBAL DEVELOPMENTAL DELAY IN A TERTIARY PEDIATRIC HOSPITAL

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INTRODUCTION

Global developmental delay (GDD) is a neurodevelopmental impairment with multiple etiologies. It is a term used when a child aged <5 years old manifests a significant delay of 2 or more standard deviations below the mean in 2 or more developmental domains, namely, gross or fine motor, language, cognition, and personal/social. Because these patients are neurologically impaired, the outcome is likely to have poorer educational attainment, which might affect employment opportunities and result in poorer health outcomes

Worldwide, an estimated 1-3% of children in this age group are affected. The Philippine Pediatric Society Registry recorded 495 cases of neurodevelopmental disorder all over the Philippines.

OBJECTIVE

The study aimed to determine the risk factors for GDD in terms of sex, nutritional status, prematurity, neonatal meningitis, and neurologic comorbidities (cerebral palsy, epilepsy, and/or birth asphyxia).

DESIGN

A case-control study was conducted among 196 children in a tertiary pediatric hospital from January 2019 to December 2021. Determination of the association between risk factors and global developmental delay was analyzed using univariate and multivariate statistics.

SETTING

The study was conducted at National Children's Hospital, a tertiary government hospital in Quezon City.

PATIENTS/PARTICIPANTS

The study participants included patients aged less than 5 years old diagnosed with GDD by a Pediatric Developmental and Behavioral specialist. Patients seen at General OPD with normal developmental status represented the control group.

MAIN OUTCOME MEASURES

Descriptive statistics using mean and standard deviation for quantitative data and frequency and percentage for qualitative data were used. Determination of the association between risk factors and GDD was analyzed using univariate and multivariate statistics. Chi-square test and logistic regression were used in the univariate analysis. Odds ratio and the 95% confidence interval were also calculated. Multiple logistic regression was then utilized. Level of significance was set at $\alpha = 0.05$.

Table 1. Demographic profile of the study participants

Demographic Profile, n=196	Cases n (%) Mean ± SD	Control n (%) Mean ± SD
Age in months	27.23 ± 14.28	25.25 ± 15.08
Sex		
Male	49 (25)	84 (42.9)
Female	17 (8.7)	46 (23.4)

Table 2. Clinical profile of the study participants

Clinical Profile, n=196	Cases n (%)	Control n (%)
GDD	66 (33.7)	0 (0)
Nutritional Status, with stunting	10 (5.1)	5 (2.6)
Neonatal Meningitis	3 (1.5)	1 (0.5)
Prematurity	18 (9.2)	1 (0.5)
Neurologic Comorbidity	41 (21.0)	4 (2.0)
Cerebral Palsy	26 (13.3)	1 (0.5)
Epilepsy	28 (14.3)	3 (1.5)
Birth asphyxia	24 (12.2)	0 (0)

Table 3. Univariate analysis of the risk factors for GDD

Profile	GDD Yes n (%) Mean ± SD	GDD No n (%) Mean ± SD	p-value [1]
Age	27.23±14.28	25.15±15.08	0.354 *
Sex			
Male	49 (36.8)	84 (63.2)	0.173
Female	17 (27.0)	46 (73.0)	
Nutritional Status, with stunting	10 (66.7)	56 (30.9)	0.005
Neonatal Meningitis	3 (75.0)	63 (32.8)	0.112 **
Prematurity	18 (94.7)	48 (27.1)	<0.001
Neurologic Comorbidity	41 (91.1)	25 (16.6)	<0.001
Cerebral Palsy	26 (96.3)	40 (23.7)	<0.001
Epilepsy	28 (90.3)	38 (23.0)	<0.001
Birth asphyxia	24 (100.0)	42 (24.4)	<0.001

[1] Pearson Chi-Square
* T-Test for Equality of Means
** Fisher's Exact Test

Table 4. Multivariate analysis of the risk factors for GDD

Profile	OR (95% Confidence Interval)	p-value
Age	1.03 (0.99 – 1.06)	0.054
Sex, male	2.24 (0.78 – 6.43)	0.136
Nutritional Status, with stunting	1.01 (0.18-5.79)	0.990
Neonatal meningitis	1.49 (0.04-60.54)	0.833
Prematurity	70.11 (7.72-637.10)	<0.001
Neurologic Comorbidity	66.72 (18.40-241.96)	<0.001

Results

The mean age of the study population was 25.8 (± 14.81) months and majority were males 67.9% (n=133). Significantly associated in the multivariate analysis were prematurity and neurologic comorbidity. The other risk factors such as sex, nutritional status (stunting), and neonatal meningitis did not show statistical relevance in relation to GDD.

Conclusion

Significant associations were found between GDD and prematurity, as well as neurologic comorbidity (cerebral palsy, epilepsy, and/or birth asphyxia).

Recommendation

It is recommended to include a higher sample size of children with neonatal meningitis for future prospective studies.

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