Intelligence and Learning Disabilities Measurement of Children with Cleft Lips and Palates Age 6 to 12 Years

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Background: Cleft lip and palate is a craniofacial congenital defects. Most syndromes with facial clefts have intellectual disability. However, both types of cleft are commonly associated with intellectual, speech and language disorders.

Objective: To determine the intellectual function and learning disorder of the selected 10 school-age children with cleft lip and palate living in Khon Kaen province, Thailand.

Material and Method: The standard IQ test (Wechsler Intelligence Scale for Children – 3rd edition) and learning achievement test by Wide Range Achievement Test-Thai version (WRAF-Thai) were performed in the 10 Children with cleft lip and palate aged between 6-12 years at Srinagarind Hospital.

Results: Mean IQ score of participants was 90.5, (SD =11.2). One case had IQ score below normal range (IQ=63) and meet criteria of intellectual disorder. Three cases met criteria of learning disorder.

Conclusion: The majority of children with cleft lip and palate had average IQ. 1/10 had intellectual disorder and three of them had learning disorder.

Keywords: Cleft lip and palates, intelligence, intellectual disabilities disorder, learning disorder

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disorders is done using the Wide Range Achievement test-Thai version (WRAT-Thai) to identify reading, writing and mathematics learning disorder.

The objectives of this study were to measure intellectual function (IQ) and learning disorder of the children with cleft lip and palate aged between 6 to 12 years at Srinagarind Hospital, Khon Kaen University, Thailand.

Material and Method

The standard IQ test (Wechsler Intelligence Scale for Children-3rd edition) and learning achievement test by Wide Range Achievement test-Thai version (WRAT-Thai) were performed in 10 children with cleft lip and palate aged between 6 to 12 years at Srinagarind Hospital. These children were originally selected from a principle project entitled “Home and environment survey, development and intelligence and learning disabilities measurement of children with cleft lips and palates, in which the main project recruited 20 children and their families (10 preschool students aged less than 6 years and 10 school-age children aged 6 to 12 years). The present study was approved by the Khon Kaen University Human Research Ethics Committee: Project number HE591110 studied in from December 2016 to May 2017. In principle project there were 20 subjects and families (10 preschool children, <6 years and 10 school age children 6 to 12 years). The present study was approved by Khon Kaen University human research ethics committee (the project number HE 591110). The clinical psychologists used the standard tool Thai version, that were validated with Thai children. The standard IQ test (Wechsler Intelligence Scale for Children-3rd edition) used to determine intellectual disabilities, Wide Range Achievement test-Thai version (WRAT-Thai) used to determine learning disorder. The results were present in mean and percentage (Table 1).

Ethical approval

The present study was approved by the Khon Kaen University Human Research Ethics Committee: Project number HE591110 studied in from December 2016 to May 2017. In principle project there were 20 subjects and families (10 preschool children, <6 years and 10 primary school children with a age range between 6 to 12 years).

Results

Mean age was 8.8 years, including 6 boys and 4 girls. The majority of children were non-syndromic CLP (9/10 cases). All children attended regular school program, and being in appropriate class level to their age except one child was delayed, because of learning disorder in mathematics. The mean IQ score of participating children was 90.5, range 69 to 108. One case had mild intellectual disability disorder (IQ = 69).

Learning disorder (LD) is a developmental disorder of children who has difficulties learning and using academic skill in reading or spelling (dyslexia) or written expression (dysgraphia) or mastering of number (dyscalculia). In this present study, there were 3 children (30%) met criteria for diagnosis of LD. Two children were dyscalculia (one boy, and one girl), another boy had mixed type of dysgraphia and dyscalculia and mathematics.

The type of cleft lip and palate might associate with IQ score and achievement score, four children with bilateral complete cleft lip with alveolar cleft with cleft palate had mean IQ = 79 (SD = 16.6), less than 6 children with left lateral complete cleft lip with alveolar cleft with cleft palate had mean IQ = 89.8 (SD = 12.77). All three children with LD had bilateral complete cleft lip with alveolar cleft with cleft palate. Bilateral CLCP seem to have brain pathology more than unilateral CLP. One children with Mathematic LD was studying studying below his grade (in Grade 3 but, actually supposed to study in Grade 12).

Discussion

In general, we have known that children with syndromic CLP may have intellectual and learning problems. In this present study, one case with syndromic CLP called Pierre Robin syndrome, 9 cases were non-syndromic CLP. Their mean IQ score was 90.5 which was average IQ, and only one had mild intellectual disability. Only 30% of the children with CLP in this present study had met criteria of learning disorder. However, the sample size was only 10, thus LD in CLP might be higher than general population (5 to 12%)⁷. The children with CLP need to evaluate cognitive and achievement ability to detect the intellectual deficit and learning disorder during school age. These problems should be solved by providing special educational programs under a national education law to keep them in the track and for their future career path.

Conclusion

The IQ and achievement tests in the children with cleft lip and palate reveal average IQ. One in ten cases had mild intellectual disabilities and three were
Table 1. Demographic data of the participating children

<table>
<thead>
<tr>
<th>Gender</th>
<th>Diagnosis</th>
<th>Comorbid</th>
<th>VIQ</th>
<th>PIQ</th>
<th>FIQ</th>
<th>R</th>
<th>W</th>
<th>M</th>
<th>Age (years)</th>
<th>School (Grade level)</th>
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<tr>
<td>Female</td>
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<td>-</td>
<td>102</td>
<td>113</td>
<td>108</td>
<td>95</td>
<td>93</td>
<td>94</td>
<td>9</td>
<td>5</td>
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<tr>
<td>Female</td>
<td>1</td>
<td>H</td>
<td>70</td>
<td>72</td>
<td>69*</td>
<td>81</td>
<td>73</td>
<td>94</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Male 2</td>
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<td>-</td>
<td>95</td>
<td>93</td>
<td>93</td>
<td>84</td>
<td>67**</td>
<td>12</td>
<td>3***</td>
<td>3</td>
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<tr>
<td>Female</td>
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<td>95</td>
<td>82</td>
<td>88</td>
<td>113</td>
<td>99</td>
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<td>9</td>
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<td>-</td>
<td>-</td>
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<td>84</td>
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<td>89</td>
<td>81</td>
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<td>95</td>
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<td>91</td>
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<td>100</td>
<td>102</td>
<td>94</td>
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<tr>
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<td>3</td>
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<tr>
<td>Male 1</td>
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<td>85</td>
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<td>76</td>
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<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>92.3</td>
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<td>87.4</td>
<td>80.5</td>
<td>81.8</td>
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<tr>
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<td></td>
<td></td>
<td>11.75</td>
<td>10.7</td>
<td>11.2</td>
<td>14.86</td>
<td>12.95</td>
<td>13.56</td>
<td>1.46</td>
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</tbody>
</table>

For diagnosis: 1 = Left complete cleft lip with alveolar cleft with cleft palate; 2 = bilateral CLCP
VIQ = verbal IQ; PIQ = performance IQ; FIQ = full IQ; R = reading score; W = writing score; M = Mathematic score; H = Hypothyroid; P = Pierre Rubin syndrome; SD = standard deviation.

* 69 = mild intellectual disability, ** LD = learning disorder, *** Below age-grade level
met criteria of learning disorder. The children with CLP need to evaluate cognitive and achievement ability to detect the intellectual deficit and learning disorders during their school age.

What is already known on this topic?
The intellectual problems in children with cleft lip and palate have to be concerned and monitored.

What this study adds?
Thai children with CLCP need to measure IQ and achievement tests to provide remedial therapy for them including, education programs, understand them and not leave them behind their peers.

Acknowledgements
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Potential conflicts of interest
None.

References
การประเมินความสามารถคณิตเลข บีดอุปยาการในเด็กปกติวัยหัดเดิน 6-12 ปี

อินทนา ลิ้มชวา, ฟิรเด อุ่นทรัพ, ชมพีทร ขวัญทรัพ, ผู้คุณวิจารณ์, สำเร็จศักดิ์, นิรมล พันธุสุตร

คุณยุทธ์: ปกติวัยหัดเดินเป็นพัฒนาการหนึ่งที่มีอุปการณ์กับเด็ก ที่มีความสามารถในการวัดมาถึงระดับ ที่มีการประเมินความสามารถคณิตเลข บีดอุปยาการในเด็กปกติวัยหัดเดิน 6-12 ปี แต่ที่ผ่านมาที่สนใจในพัฒนาการบีดอุปยาการบีดอุปยาการในเด็กและด้านการพัฒนาการในเด็ก

วัตถุประสงค์: เพื่อประเมินการพัฒนาการคณิตเลข บีดอุปยาการในเด็กปกติวัยหัดเดิน 6-12 ปี ที่มีการวัดตามที่มีการประเมินความสามารถของเด็กปัจจุบัน ที่มีการวัดตามที่มีการประเมินความสามารถ

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ผลการศึกษา: คะแนนเฉลี่ยคณิตเลข บีดอุปยาการในเด็กปัจจุบัน 90.5 มี 1 คน จาก 10 คน มีคะแนนที่มากกว่ามาตรฐานการวัดลักษณะคณิตเลข บีดอุปยาการในเด็กปัจจุบัน และมี 3 คน ที่มีการประเมินความสามารถ

สรุป: คณิตเลข บีดอุปยาการในเด็กปัจจุบันมี 1 ใน 10 คน มีการประเมินคณิตเลข บีดอุปยาการในเด็กปัจจุบัน 90.5 และมี 3 คน มีการประเมินคณิตเลข บีดอุปยาการในเด็กปัจจุบัน 90.5