

Treatment Outcome of 4 to 7 Years-Old Patients with Cleft Lip and Cleft Palate in Tawanchai Center, Srinagarind Hospital: Charge Cost

Lekbunyasin O, MBA¹, Chantachume V, BSc¹, Pradubwong S, MSN², Chowchuen B, MD, MBA³

¹ Department of Medical Records and Statistics, Srinagarind Hospital, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

² Division of Nursing, Srinagarind Hospital, Khon Kaen University, Khon Kaen, Thailand

³ Division of Plastic Surgery, Department of Surgery, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Background: According to the protocol established by the interdisciplinary team, patients with cleft lip and cleft palate (CLP) need to undergo surgery in order to experience good treatment outcomes. However, some medical expenses are incurred during this process.

Objective: To examine the costs related to surgery as compared to the compensation received according to the diagnosis related groups (DRG).

Materials and Methods: A descriptive study was conducted using the medical records of the patients with CLP, who had received treatment at the Tawanchai Center (KKU Cleft Center). The data was collected for 3 months and included general information, the details of the surgery, and the costs. Afterwards, the collected data was analyzed using percentages, means and standard deviations.

Results: It was found that there were 93 patients had undergone the surgery, and 56 of them had been males (60.22%). The number of patients (percent) receiving Cheiloplasty, Palatoplasty, cleft lip and nose correction, and closure fistula had been 93 patients (100%), 90 patients (100%), 24 patients (25.81%), and 15 patients (16.13%), respectively. Each of the treatments had average costs at 12,515 baht, 16,229 baht, 14,895 baht and 20,315 baht, respectively. Fifty four patients, which was considered as the highest number, had undergone the surgery twice (58.06%) and 1 patient had undergone the surgery 6 times, which indicated the highest frequency (1.08%). The costs of the surgery were compared with the allocated financial support (84.56%) according to DRG. The payment rate was 9,000 baht per 1 relative weight (AdjRW).

Conclusion: The average costs of a closure fistula procedure were higher than the average costs of Cheiloplasty and Palatoplasty. 84.56 percent of the patients had been allocated with financial support according to DRG. The proper payment rate was 10,643 baht per 1 AdjRW.

Keywords: Tawanchai Center (KKU Cleft Center) cleft lip and cleft palate, Diagnosis related groups (DRG), Adjust relative weight (AdjRW)

J Med Assoc Thai 2019;102(Suppl5): 40-4

Website: <http://www.jmatonline.com>

CLP is the fourth most common neonatal disability found in newborn babies, which means a rate of about 1 per 600 of surviving newborn babies⁽¹⁾. The incidence of cleft palate in Thailand was found to be 1.1 per 1,000 persons⁽²⁾ and is likely to remain stable. The incidence rose to 2.49 per 1,000 newborn babies⁽³⁾, which is considered to be the highest incidence of cleft palate in Thailand and in the world. In addition, the incidence of cleft palate in surviving newborn babies was 1.62 per 1,000 births⁽⁴⁾.

Currently, hospitals receive medical compensation from the National Health Security Office (NHSO) in accordance with the DRG. The service cost or unit cost was calculated using an AdjRW, which is the key statistic of DRG and DRG payment. The AdjRW is a set of numbers, which the health care centers receive and which are in agreement with the health insurance fund. It is calculated from the average costs of treatment for certain groups of patients with a disease compared to the average cost of treatment for all patients with the disease. The AdjRW was adjusted, which means that the length of stay in hospital is related to the treatment costs of patients for each group of diseases⁽⁵⁾. Therefore, to know the charged costs after several changes to the costs, it is necessary to study the service costs in order to plan the care, which could contribute the best benefits for the patients and for the organizations.

Correspondence to:

Chowchuen B.

Division of Plastic Surgery, Department of Surgery, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand

Phone: +66-43-363123, **Fax:** +66-43-202558

E-mail: bowcho@kku.ac.th, bchowchuen@gmail.com

How to cite this article: Lekbunyasin O, Chantachume V, Pradubwong S, Chowchuen B. Treatment Outcome of 4 to 7 Years-Old Patients with Cleft Lip and Cleft Palate in Tawanchai Center, Srinagarind Hospital: Charge Cost. J Med Assoc Thai 2019;102;Suppl5: 40-4.

Objective

To study the surgical costs for CLP patients according to the protocol of the Tawanchai Center of Srinagarind Hospital, and to compare the costs being charged with the compensation of medical services received from the NHSO according to the DRG.

Materials and Methods

This descriptive study examined the patients with cleft lip and cleft palate between the ages of 4 to 7 years, who had undergone surgery at the Tawanchai Centre at Srinagarind Hospital at the Faculty of Medicine, Khon Kaen University. After permission had been received to conduct this research on humans from the Ethics Committee of Khon Kaen University (HE601414), the data was collected for three months (January to March 2018), which included general information, details of the surgery, and the costs of the surgery. The statistics used for the analysis in the study were percentages, means, and standard deviations.

Results

Regarding the general information, the following was found: a) there were 93 patients in total; b) most of the patients were male, 56 patients (60.22%); c) 67 patients had one-sided CLP (72.04%); d) 23 patients had two-sided CLP (24.73); e) 3 patients had only cleft lips (3.23%); f) according to the criteria, 4 patients underwent Cheiloplasty later than the correct time (4.3%); and g) according to the criteria, 3 patients underwent Palatoplasty later than the correct time

(3.23%). There were 19 cases of having oronasal fistula (ONF) (20.88%), and 4 cases of syndromics were found (4.30%).

According to the costs of the surgery, it was revealed that the average costs were as follows: a) the Cheiloplasty for the 93 patients was 12,515 baht (100%) with an average AdjRW of 1.2927, b) the average cost for the Palatoplasty of 90 patients was 16,229 baht (100%) with an average AdjRW of 1.4773, c) the average cost for cleft lip nose correction (CLN) of 24 patients (25.81%) was 14,895 baht with an average AdjRW of 1.3415, and d) the average cost for a closure fistula procedure for the 15 patients was 20,315 baht (16.13%) with an average AdjRW of 1.5622. There were 66 patients, who had undergone Cheiloplasty, which had an average cost of 12,000 baht and an average AdjRW of 1.2173. The highest average cost belonged to closure fistula including 7 patients with an average cost of 22,870 baht and an average AdjRW of 1.7590 (Table 1).

When the charged costs for medical treatment were compared with the money allocated according to the DRG system at the rate of 9,000 baht per 1 AdjRW, it was found that Cheiloplasty had been allocated at 92.96 percent of the charge cost by DRG, that Palatoplasty had been allocated at 81.93 percent, CLN correction had been allocated at 81.06 percent, and that closure fistula had been allocated at 69.21 percent (Table 2).

In regard to the number of surgical operations in patients between 4 to 7 years of age, it was found that the highest number of surgeries for one patient had been 6 (1.08%) with a total cost of 91,974 baht and an AdjRW of 8.4873.

Table 1. The charged cost and Adjust relative weight (AdjRW) by type of the surgery

Type of the surgery	Total		Charged cost			AdjRW		
	Patients	Total	Mean	SD	Total	Mean	SD	
Cheiloplasty	93	1,163,920	12,515	3,659	120.2201	1.2927	0.3678	
Cheiloplasty	66*	792,019	12,000	3,071	80.3432	1.2173	0.2749	
Cheiloplasty with primary nose correction	28*	371,901	13,282	2,812	39.8769	1.4242	0.3799	
Palatoplasty	90	1,460,579	16,229	5,441	132.9545	1.4773	0.5528	
2 flap palatoplasty with IVV with myringotomy	41**	655,069	15,977	3,395	55.8360	1.3619	0.4487	
2 flap palatoplasty	39**	615,722	15,788	5,515	55.8020	1.4308	0.5455	
2 flap palatoplasty with CLN correction	9	138,861	15,429	6,609	16.3861	1.8207	0.7664	
2 flap palatoplasty with CLN with myringotomy	3	50,927	16,976	2,698	4.9304	1.6435	0.1179	
Cleft Lip Nose correction	24	357,472	14,895	4,921	32.1961	1.3415	0.4703	
CLN correction	22	320,687	14,577	5,014	30.0053	1.3639	0.4858	
CLN with myringotomy	2	36,785	18,393	1,518	2.1908	1.0954	0.0000	
Closure fistula	15	304,729	20,315	12,502	23.4332	1.5622	1.1272	
Closure fistula with CLN correction	9*	144,636	16,071	3,624	11.1205	1.2356	0.0808	
Closure fistula	7*	160,093	22,870	12,854	12.3127	1.7590	1.1726	
Total	93	3,286,700	35,341	12,406	308.8039	3.3205	1.1457	

* One patient have two surgery

** Two patients have two surgery include 2 flap palatoplasty with IVV with myringotomy and 2 flap palatoplasty

The majority (54 patients) had undergone the surgery twice (58.06%) at an average cost of 27,917 baht per person and an AdjRW of 2.7152. This was followed by 31 patients who had undergone the surgery three times with an average cost of 44,190 baht per person and an AdjRW of 3.9324 (Table 3).

When the charged costs for medical treatment was compared with the money allocated according to the DRG at a rate of 9,000 baht per 1 AdjRW, it was found that the financial support, which was allocated had covered 84.56 percent of the costs charged. Of the surgeries carried out, there was only one surgery for which the allocation had covered 99.28 percent, which was the closest in amount to the actual costs charged (Table 4).

Discussion

According to the study of the costs for all types of CLP surgery in relation to the Protocol of Tawanchai Center at Srinagarind Hospital, Cheiloplasty was found to be the

highest with an average cost of 12,515 baht. The cost was close to the findings from a study by Chiwarat Otton, et al⁽⁶⁾ in which it was found that the average cost for Cheiloplasty was 12,025 baht, but the average compensation, which had been allocated from the NHSO, was only 10,527.63 baht. This obviously indicated that the cost allocated from the NHSO was close to the costs charged. However, the current medical treatment rate has been adjusted. In fact, the cost for nursing rooms has increased. The average costs of Cheiloplasty and Palatoplasty were 22,471 baht and 31,680 baht. The cost was close to the findings from a study by Siwakorn Jearanai⁽⁷⁾ in which it was found that cost of cleft lip repair was 18,506.70±3,533.29 baht, cost of cleft palate repair was 18,068.42±1,824.23 baht, cost of alveolar bone grafting was 20,365.09±7,499.30 baht and cost of rhinoplasty was 13,624.88±1,303.57 baht, respectively. Therefore, if the most recent cost data is needed, additional studies will be required in the current year.

Table 2. The Charge cost and Reimbursement base on DRG by type of the surgery

Type of the surgery	Total patients	AdjRW (1)	Charged cost		Margin (4) = (3)-(2)	Percent
			Charge cost (2)	Reimbursement = (1)x9,000 (3)		
Cheiloplasty	93	120.2201	1,163,920	1,081,981	-81,939	92.96
Cheiloplasty	66*	80.3432	792,019	723,089	-68,930	91.30
Cheiloplasty with primary nose correction	28*	39.8769	371,901	358,892	-13,009	96.50
Palatoplasty	90	132.9545	1,460,579	1,196,591	-263,989	81.93
2 flap palatoplasty with IVV with myringotomy	41**	55.8360	655,069	502,524	-152,545	76.71
2 flap palatoplasty	39**	55.8020	615,722	502,218	-113,504	81.57
2 flap palatoplasty with CLN correction	9	16.3861	138,861	147,475	8,614	106.20
2 flap palatoplasty with CLN correction with myringotomy	3	4.9304	50,927	44,374	-6,553	87.13
Cleft Lip Nose correction	24	32.1961	357,472	289,765	-67,707	81.06
CLN correction	22	30.0053	320,687	270,048	-50,639	84.21
CLN with myringotomy	2	2.1908	36,785	19,717	-17,068	53.60
Closure fistula	15	23.4332	304,729	210,899	-93,830	69.21
Closure fistula with CLN	9*	11.1205	144,636	100,085	-44,552	69.20
Closure fistula	7*	12.3127	160,093	110,814	-49,279	69.22
Total	93	308.8039	3,286,700	2,779,235	-507,465	84.56

* One patient have two surgery

** Two patients have two surgery include 2 flap palatoplasty with IVV with myringotomy and 2 flap palatoplasty

Table 3. The costs of the surgery and AdjRW by number of surgeries

Number of surgery	Patients		Charged cost			AdjRW		
	Total	Percent	Total	Mean	SD	Total	Mean	SD
1	1	1.08	9,910	9,910	0	1.0932	1.0932	0
2	54	58.06	1,507,491	27,917	5,038	146.6222	2.7152	0.6605
3	31	33.33	1,369,896	44,190	8,100	121.9031	3.9324	0.6648
4	6	6.45	307,429	51,328	3,770	30.6981	5.1164	0.6296
6	1	1.08	91,974	91,974	0	8.4873	8.4873	0
Total	93	100.00	3,286,700	35,341	12,406	308.8039	3.3205	1.1457

Table 4. The charge cost and reimbursement base on DRG by number of surgeries

Number of surgery	Patients		AdjRW (1)	Charged cost		Margin (4) = (3)-(2)	Percent
	Total	Percent		Charge cost (2)	Reimbursement = (1) x 9,000 (3)		
1	1	1.08	1.0932	9,910	9,839	-71	99.28
2	54	58.06	146.6222	1,507,491	1,319,600	-187,891	87.54
3	31	33.33	121.9031	1,369,896	1,097,128	-272,768	80.09
4	6	6.45	30.6981	307,429	276,283	-31,146	89.87
6	1	1.08	8.4873	91,974	76,386	-15,588	83.05
Total	93	100.00	308.8039	3,286,700	2,779,235	-507,465	84.56

In this study, the majority of the patients outside area NHSO 7 Khon Kaen held gold cards, and the payment rate was at 9,000 baht per one AdjRW. At present, the compensations for medical services used by the patients from the health insurance of the National Health Security Office are paid in relation to the DRG. This is based on the AdjRW or takes into consideration the number of times and the average cost of care for certain DRG patients as compared to the average cost of all groups of DRG patients. The AdjRW (the number of times) is used as the variable and is multiplied by the allocated budget. Presently, one unit of the AdjRW in the NHSO Area 7 is 7,700 baht and is 9,000 baht for the outside areas. The factors used to categorize the groups of the diseases are as follows: 1) Primary Code, Secondary Code, and Complication Code in relation to ICD-10 of the WHO, 2) Non-OR Procedure Code in relation to ICD-9-CM, 3) age, 4) gender, 5) the child's weight (in case the child is under one year old), and 6) the types of discharge⁽⁸⁾.

When comparing the costs charged with the compensation allocated in relation to DRG, it was found that the compensation covered 84.56 percent of the costs charged. The proper compensation was at 10,643 baht per 1 AdjRW, which is in line with the students of Chiwarat Otton, et al⁽⁶⁾, who stated that the average cost of Cheiloplasty was 12,025.14 baht, while the average compensation received from NHSO was 10,527.63 baht or 87.55 percent of the total costs charged. In addition, Rampan Pattaranit, et al⁽⁹⁾ revealed that the cost of a onetime medical treatment for cleft patients between the ages of 4 to 5 years at Tawanchai Center had ranged from 9,675 to 13,444 baht. The patient, who had undergone surgery the most frequently, had been operated on 6 times. The case, received the compensation calculated from the AdjRW multiplied by the payment rate of the patients living inside the area, which covered 75.75 percent of the total costs charged. In this study, the average cost for medical treatment was higher than that of the previous studies due to an increase in medical fees, which corresponds to the additional costs for the use of modern medical technology. This study revealed that the hospital had received funding, which had been allocated in relation to the DRG system. The payment rate, which was at 9,000 baht per one AdjRW, covered 84.56 of the costs charged. However, the correct

payment rate should be at 10,643 baht per one AdjRW.

Conclusion

Closure fistula required an average cost, which was greater than that of Cheiloplasty and the Palatoplasty. When the costs charged were compared with the budget allocated in relation to the DRG, the compensation covered 84.56 percent of the charges. Therefore, the proper compensation rate should be 10,643 baht per 1 AdjRW.

What is already known on this topic?

National Health Security Office pays the compensation for medical services for the patients using health insurance to the hospitals in accordance with the DRG system. The calculation is based on the AdjRW or the number of times of an average cost is paid for the patients in certain groups of DRG to the average cost of all groups of DRG patients. One unit of the current AdjRW in Area NHSO 7 Khon Kaen is 7,700 baht, and for the outside areas, the amount increases to 9,000 baht.

What this study adds?

This study revealed that the budgets allocated to hospitals were based on the DRG system using the payment rate at 9,000 baht per one AdjRW. This amount of budget only covers 84.56 percent of the charge cost. However, the proper payment rate should be 10,643 baht for each AdjRW.

Acknowledgements

We would like to express sincere appreciation to the Executives of Srinagarind Hospital, who allowed the researcher to collect the data. In addition, the researcher would like to thank the interdisciplinary team and the staff members of The Center of Cleft Lip-Cleft Palate and Craniofacial Deformities, Khon Kaen University under Tawanchai Royal Grant Project (Tawanchai Center) for helping to collect the data. Last but not least, sincere thanks go to the Center for Cleft Lip-Palate Research, which sponsored this study and its publication.

Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Chowchuen B, Kiatchoosakun P. Guidebook of incidence, cause, prevention, cleft lip-cleft palate and craniofacial deformities. 2nd ed. Khon Kaen: Klungnana Printing Press; 2013.
2. Ratanasiri T, Junthathamrongwat N, Apiwantanakul S, Wongkam C, Chowchuen B. The birth incidence of cleft lip and palate at Srinagarind Hospital, 1990-1999. *Srinagarind Med J* 2001;16:3-7.
3. Ruangsitt C, Phraserthsang P, Banpho Y, Lamduan W, Giathamnuay S, Nuwantha A. Incidence of cleft lip and cleft palate in three hospital in Khon Kaen. Khon Kaen: Department of Orthodontics Faculty of Dentistry, Khon Kaen University; 1993. [in Thai]
4. Chowchuen B, Thanaviratananich S, Chichareon V, Kamolnate A, Uewichitrapochana C, Godfrey K. A Multisite study of oral clefts and associated abnormalities in Thailand: The epidemiologic data. *Plast Reconstr Surg Glob Open* 2015;3:e583.
5. Khiaocharoen O, Zungsontiporn C, Choeypasert S, Pannarunothai S. Adjustment of relative weight of Thai diagnosis group No. 6.1 by daytime criteria [Internet]. 2017 [cited 201 Nov 12]. Available from: <http://www.tcmc.or.th/main/index.php/file-download/category/6-tdrg-development?download=113-6-1>.
6. Odtan C, Rittirod T, Pradubwong S, Chowchuen B. Cost management of cleft lips under the Universal Health Coverage Program of the Tawanchai Cleft Center, Srinagarind Hospital, Faculty of Medicine, Khon Kaen University. *J Med Assoc Thai* 2014;97 Suppl 10:S53-8.
7. Jearanai S. Estimate charge cost for cleft lip and cleft palate treatment in payer's perspective: a study of in-patient, Dental Hospital, Prince of Songkla University [thesis]. Songkla, Thailand: Prince of Songkla University; 2017.
8. National Health Security Office. Management guide of national health security office fund 1 fiscal year 2012 medical expense management service and psychiatric service statements. Bangkok: Aroonkarnpim; 2012.
9. Pattaranit R, Lekbunyasit O, Chantachum V, Songsung C, Pradubwong S. Study of in-patients' charge cost of the cleft lip and cleft palate patients aged 4-5 years old of Tawanchai Center, Srinagarind Hospital. *Srinagarind Med J* 2013;28;23-9.