Prevalence and Trend of Patients with Congenital Malformations of Craniofacial in Srinagarind Hospital in Fiscal Year 2005 to 2014

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Background: Congenital malformations of craniofacial defects involved multiple disorders, including abnormality of the face, head, nervous system, eyes, ears, teeth etc. To explore more about demographic characteristics of these patients will provide benefits for doctors, nurses, guardians and the patients themselves in order to make decision on treatments and may lead to further study for disease prevention..

Objective: To examine prevalence and trend of patients with congenital malformations of craniofacial anomalies in Srinagarind hospital.

Material and Method: All medical records of the patients with congenital craniofacial malformations were reviewed in this descriptive study using ICD-10 codes of Q00-Q38, Q67 and Q75 groups. These patients were treated at Srinagarind Hospital in the last 10 years (fiscal years: during October 2005-September 2014). The data, consist of age, gender, address, right of medical treatment and the frequency of treatment were collected for 6 months. Data were analyzed using descriptive statistics in average and percentage.

Results: The present study found the number of 10,272 patients received medical services in Srinagarind hospital in the last 10 years. The majority of the patients were male (52.40%). The patients with cleft lip-cleft palate were 26.64% (Q37), age ranged between 0-5 years (59.68%). According to the records in 2011, these patients were received treatments 3.74 times per year, and mainly lived in Khon Kaen. The present study also found 81.07% of the patients used a universal health coverage Scheme of other hospitals. Obviously, the number of patients with congenital malformations of craniofacial defects increased year by year.

Conclusion: In conclusion, most of the patients with congenital craniofacial malformations were males with cleft lip-cleft palate. They received treatment during the age of 0-5 years. Furthermore, they used a universal health coverage Scheme of other hospitals. The trend of congenital craniofacial malformations has increased year by year. The results of this present study may enable the provision of suitable treatments for patients with congenital craniofacial malformations.

Keywords: Prevalence, Trend, Patients with congenital malformations, Craniofacial defects, Srinagarind hospital

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Congenital malformations of craniofacial anomalies might be combined with complex conditions, such as cleft lip and palate, front oethmoidalmening oencephalocele (FEEM), congenital asymmetric face,

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Chowchuen B, Division of Plastic Surgery, Department of Surgery, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand. Phone: +66-43-363123 E-mail: bowcho@kku.ac.th congenital hydrocephalus, and encephalocele⁽¹⁾. This complexity caused by the abnormality of many systems such as head and face deformities, optic and auditory nerves abnormalities, and occlusion.

Apart from that mentioned above, there might be more disorders being syndrome, development and evolution problems of a child patient. The complexity of treatment is the patients need to obtain the treatments since they were born until adulthood. For this reason, it requires having holistic care to achieve the best outcome by multidisciplinary team which consists of experts from various fields such as plastic surgeons, neurosurgeons, otolaryngologists, speech therapists, ophthalmologists, radiologists, pediatricians, anesthesiologists, pedodontists, orthodontists, prosthodontists, and special nurses⁽²⁾.

Previous research indicated that cleft lips and palate, one of congenital malformations of craniofacial, are found in Asian or people with yellow skin more than in white or black skin people. It was rarely found in Western European countries. In Thailand, the overall incidence of congenital malformations of craniofacial anomalies is 1.6 in 1,000 newborns, and 59% are very poor people from North Eastern region⁽³⁾. It is believed that these malformations caused by genetic and environmental factors which have not been clearly evident.

The effects of the congenital malformations of craniofacial anomalies affected the patients themselves, their parents and families both physically and mentally. Obviously, the abnormalities affect the shape and structure of face. In addition, the complications of these abnormalities might affect speech, hearing, structure of maxilla and mandible, dental problems and delayed development. Therefore, the treatment should be conducted systematically by the multidisciplinary team⁽²⁾.

World Health Organization (WHO) applies International Statistical Classification of Diseases and Related Health Problems (ICD10) to categorize the patients with congenital malformations of craniofacial anomalies⁽⁴⁻⁷⁾. The ICD10 is the code to classify the diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injuries or diseases. The code set comprises of 155,000 codes. For instance, the code Q00-Q99 refers to congenital malformations, deformations and chromosomal abnormalities diseases. In this present study, the code Q00-Q38, Q67 and Q75 were used for congenital malformations of craniofacial defects.

Srinagarind Hospital is the tertiary care unit, where the Tawanchai Center of Excellence established for Patients with Cleft Lip-Palate and Craniofacial Deformities. In addition, the Tawanchai Foundation, which provides support for the care and treatment, surgery, rehabilitation for patients with cleft lips and palate and craniofacial deformities, has been established for people in North Eastern Thailand. Thus, there was a number of patients with congenital malformations who came to Srinagarind hospital for treatment by the referral system and walk-in. Possessing with primary data relate to congenital malformations patients would significantly benefit patients/caregivers, organizations, and the multidisciplinary team. Therefore, this present study aimed to examine primary data and trend of patients with congenital malformations of craniofacial anomalies during the fiscal year of 2005 – 2014 (during October 2005-September 2014).

Objective

To examine prevalence and trend of patients with congenital malformations of craniofacial anomalies in Srinagarind hospital during the fiscal year of 2005-2014.

Material and Method

The descriptive retrospective study was conducted with permission of the Director of Srinagarind Hospital after the ethics in human research was approved by Khon Kaen University (HE581386). The medical records of patients with congenital malformations of craniofacial anomalies in Srinagarind Hospital were investigated. The investigation was conducted within 10 years from the fiscal year of 2005-2014 using ICD-10 code set of Q00-Q38, Q67 and Q75. A total number of the patients were 10,272 persons. Primary data such as age, gender, province, location, health coverage and frequency of obtaining treatments were collected for 6 months (during June – November 2016). Data were analyzed using descriptive statistics base on averages and percentage.

Results

Among 10,272 patients with congenital malformations of craniofacial deformities came to Srinagarind Hospital in the last 10 years during the fiscal years of 2005-2014. The majority of patients were male (52.40%). The highest prevalence of the patients was found in 2014 with 15.50% and the trend is increasing every year (Table 1).

Table 2 displays frequency of obtaining the treatments in the patients with craniofacial anomalies. In 2011, the result showed a highest number of hospital visits of the patients with 3.74 visits/year, followed with 3.73 visits/year in 2008, and 3.53 visits/year in 2010.

Table 3 displays the patients by age who obtained treatments. The results showed that the majority of the patients aged between 0 to 5 years (59.68%), followed by 6-10 years (18.13%).

Regarding the patients that received medical services in Srinagarind Hospital categorized by living

Fiscal year			Percentage	Rate of			
	Males	Percentage	Females	Percentage	Total		increase
2005	311	52.45	282	47.55	593	5.77	-
2006	297	50.86	287	49.14	584	5.69	-1.54
2007	331	49.85	333	50.15	664	6.46	12.05
2008	418	53.52	363	46.48	781	7.60	14.98
2009	464	51.90	430	48.10	894	8.70	12.64
2010	507	53.37	443	46.63	950	9.25	5.89
2011	599	53.43	522	46.57	1,121	10.91	15.25
2012	798	52.60	719	47.40	1,517	14.77	26.10
2013	823	52.19	754	47.81	1,577	15.35	3.80
2014	835	52.48	756	47.52	1,591	15.50	0.88
Total	5,383	52.40	4,889	47.60	10,272	100.00	-

 Table 1. Number and percentage of patients with congenital malformations of craniofacial deformities categorized by gender, fiscal year and rate of increase

Table 2. The frequency of patients with congenital malformations of craniofacial anomalies obtaining treatments in Srinagarind hospital categorized by gender, fiscal year, and frequency of visit

Fiscal year]	Frequency of vis	it	Number of	Average		
	Males (n)	Females (n)	Total (n)	Males (n)	Females (n)	Total (n)	(visit/year)
2005	1,068	883	1,951	311	282	593	3.29
2006	1,025	1,018	2,043	297	287	584	3.50
2007	1,070	1,066	2,136	331	333	664	3.22
2008	1,505	1,411	2,916	418	363	781	3.73
2009	1,586	1,509	3,095	464	430	894	3.46
2010	1,769	1,580	3,349	507	443	950	3.53
2011	2,240	1,956	4,196	599	522	1,121	3.74
2012	2,425	2,344	4,769	798	719	1,517	3.14
2013	2,583	2,397	4,980	823	754	1,577	3.16
2014	2,702	2,495	5,197	835	756	1,591	3.27
Total	17,973	16,659	34,632	5,383	4,889	10,272	3.37

place, the present study found that the majority of patients lived in Khon Kaen, Mahasarakham, Roi Et, and Kalasin, with percentage of 22.70, 9.55, 9.06, and 8.56, respectively (Table 4).

According to the ICD10, the most common type of congenital malformations of the patients with craniofacial deformities was Q37 (Cleft palate with cleft lip) (26.64%), followed by the Q36 (cleft lip) (11.95%), and the Q10 (the congenital malformations of eyelid, lacrimal apparatus and orbit) (11.18%) (Table 5).

For the type of health coverage, the majority of the patients used universal health coverage schemes of other hospitals (81.07%), followed by the Civil Servant Medical Benefit Scheme (11.58%), and self-pay (3.74%) (Table 6).

Discussion

According to the results of the out-patients with congenital malformations of craniofacial from the fiscal years of 2005 to 2014 with ICD-10 code set of Q00-Q38, Q67 and Q75 treating in Srinagarind Hospital, it revealed that the number of patients with these malformations are likely to be increasing every year. The highest number of the patients was in 2014 with a percentage of 15.50. The majority of patients were male with cleft palate and cleft lip, the age ranged between 0-5 years, and type of health coverage was universal health coverage scheme from other hospitals. These results are relevant to the study of Lekbunyasin⁽⁸⁾, and Suteera et al^(9,10) which found that the majority of the patients were male with cleft lip and palate, and their

Age		Total	%									
	2005 (n)	2006 (n)	2007 (n)	2008 (n)	2009 (n)	2010 (n)	2011 (n)	2012 (n)	2013 (n)	2014 (n)	(n)	
0-5	380	349	416	483	531	603	669	906	917	876	6,130	59.68
6-10	82	91	106	132	163	165	219	277	304	323	1,862	18.13
11-15	45	46	50	53	84	72	97	131	143	141	862	8.39
16-20	27	35	31	48	40	40	66	68	76	98	529	5.15
21-25	14	13	14	17	18	25	23	42	38	60	264	2.57
26-30	8	9	10	13	9	9	9	20	13	15	115	1.12
31-35	7	7	5	7	12	4	8	8	10	21	89	0.87
36-40	6	7	4	7	9	5	8	14	14	12	86	0.84
41-45	1	4	8	7	5	7	6	12	14	11	75	0.73
46-50	5	3	5	5	5	3	5	10	13	9	63	0.61
51-55	3	3	4	5	2	7	2	9	10	8	53	0.52
56-60	3	5	2	1	5	2	0	5	7	7	37	0.36
>60	12	12	9	3	11	8	9	15	18	10	107	1.04
Total	593	584	664	781	894	950	1,121	1,517	1,577	1,591	10,272	100.00

 Table 3. The patients with congenital malformations of craniofacial deformities obtained the treatments in Srinagarindhospital categorized by fiscal year and age

 Table 4. The patients with congenital malformations of craniofacial deformities receiving treatments in Srinagarind hospital categorized by fiscal year and living place

Province	Fiscal year											%
	2005 (n)	2006 (n)	2007 (n)	2008 (n)	2009 (n)	2010 (n)	2011 (n)	2012 (n)	2013 (n)	2014 (n)	(n)	
KhonKaen	155	139	157	208	210	214	226	341	347	335	2,332	22.70
Maha-sarakham	69	69	77	62	77	88	101	137	154	147	981	9.55
Roi- Et	35	35	50	68	85	88	107	142	152	169	931	9.06
Kalasin	52	57	58	59	80	85	99	120	135	134	879	8.56
Udonthani	43	45	45	44	56	75	78	105	106	112	709	6.90
SakonNakhon	45	43	48	56	66	68	79	97	101	105	708	6.89
Chaiyapumi	37	42	40	59	57	69	77	100	78	85	644	6.27
Loei	26	34	46	50	51	48	66	94	102	103	620	6.04
Nongkhai	23	28	31	40	50	56	70	77	81	83	539	5.25
NongBuaLamphu	29	17	34	37	45	49	54	63	70	69	467	4.55
Buriram	11	5	7	14	17	17	29	36	42	42	220	2.14
Nakhon-phanom	11	12	12	15	16	13	23	32	34	31	199	1.94
Yasothon	16	16	17	17	21	15	17	25	27	24	195	1.90
NakhonRatchasima	7	10	8	13	13	17	24	39	23	27	181	1.76
UbonRatchathani	6	7	5	5	8	5	15	25	22	21	119	1.16
Mukdahan	10	8	6	5	10	6	13	18	20	22	118	1.15
Surin	2	1	1	4	5	6	13	14	18	14	78	0.76
Srisaket	3	2	7	7	4	7	6	9	17	13	75	0.73
Amnat Charoen	6	5	6	6	5	6	4	10	16	11	75	0.73
Phetchabun	2	1		5	7	7	8	14	13	14	71	0.69
Lao PDR	3	5	5	2	5	2	5	9	8	14	58	0.56
Bangkok	-	1	2	1	2	1	1	1	2	3	14	0.14
Other	2	2	2	4	4	8	6	9	9	13	59	0.57
Total	593	584	664	781	894	950	1,121	1,517	1,577	1,591	10,272	100.00

ICD-10	Diagnosis	Fiscal year										Total	%
		2005 (n)	2006 (n)	2007 (n)	2008 (n)	2009 (n)	2010 (n)	2011 (n)	2012 (n)	2013 (n)	2014 (n)	(n)	
Q37 Q36 Q10	 Cleft palate with cleft lip Cleft lip Congenital malformations of eyelid, lacrimal apparatus 	137 114 58	126 103 38	153 105 47	187 132 81	224 144 109	259 134 114	293 140 139	402 141 249	455 124 163	500 90 150	2736 1227 1148	26.64 11.95 11.18
Q35 Q12	4. Cleft palate5. Congenital lens	58 40	68 48	77 49	88 62	87 77	110 78	120 101	106 128	145 112	155 123	1014 818	9.87 7.96
Q18	6. Other congenital malformations of face	37	36	43	39	46	30	32	71	81	77	492	4.79
Q17	and neck 7.Other congenital malformations of ear	23	27	27	26	30	29	54	59	80	71	426	4.18
Q04	8. Other congenital malformations of brain	13	13	17	20	17	19	43	61	75	78	356	3.47
Q15	9.Other congenital malformations of eye	18	19	18	22	30	22	31	40	42	46	288	2.80
Q02 Q38	10. Microcephaly 11. Other congenital malformations of tongue, mouth and pharynx	12 18	14 15	21 14	18	22	35	29	37	34	23	245	2.39
Q01 Q75	12. Encephalocele 13. Other congenital malformations of skull and face bones	13 7	16 9	19 15	20 13	16 9	13 15	18 19	29 37	44 50	41 46	229 220	2.22 2.13
Q13	14. Congenital malformations of anterior	10	15	14	9	11	11	27	26	33	32	188	1.82
Q03	15. Congenital	9	6	11	4	10	14	12	32	39	28	165	1.60
Q11	16. Anophthalmos, microphthalmos and macrophthalmos	5	7	9	7	8	15	23	17	24	16	131	1.28
Q67	17. Congenital musculoskeletal deformities of head, face, spine and chest	3	4	3	6	7	8	3	19	23	21	97	0.93
Q16	18. Congenital malformations of ear causing impairment of	6	7	6	6	11	11	7	7	9	16	86	0.84
Q14	19. Congenital malformations of posterior	3	4	4	12	12	11	13	8	11	6	84	0.82
Q30	20. Congenital malformations of nose	9	9	11	5	4	5	5	10	6	14	78	0.75
Q00	21. Anencephaly and similar malformations	0	0	1	2	0	1	0	0	0	0	4	0.04
Total		593	584	664	781	894	950	1,121	1,517	1,577	1,591	10,272	2 100.00

 Table 5. The most common complications in the patients with congenital malformations of craniofacial deformities categorized by fiscal year and ICD-10

Health Payment	2005 (n)	2006 (n)	2007 (n)	2008 (n)	2009 (n)	2010 (n)	2011 (n)	2012 (n)	2013 (n)	2014 (n)	Total (n)	%
Universal Coverage Scheme:Other hospitals	409	433	474	609	735	780	942	1275	1346	1325	8328	81.07
Civil Servant Medical Benefit Scheme	93	77	102	109	102	112	125	148	149	172	1189	11.58
Self-pay	61	50	65	37	26	25	23	38	25	34	384	3.74
Universal Coverage Scheme:Main Srinagarind hospital	6	13	6	8	14	16	17	26	28	30	164	1.60
Social Security Scheme:Other hospitals	12	6	7	12	10	13	11	22	24	23	140	1.36
Social Security Scheme:Srinagarind hospital	12	5	10	6	7	4	3	8	5	7	67	0.65
Total	593	584	664	781	894	950	1,121	1,517	1,577	1,591	10,272	100.00

Table 6. The type of health coverage of the patients with congenital malformations of craniofacial anomalies categorized by type of health coverage and fiscal year

age ranged between 0-5 years. The patient in this present study lived in Khon Kaen province and mostly used the universal health coverage scheme from other hospitals.

Srinagarind Hospital is the medical school affiliated hospital with many experts, high-technology tools and equipment as a world-class standard, of where the congenital malformations of craniofacial patients with high-risk and complexity are referred increasingly to obtain treatments. Moreover, it is where the Tawanchai Center of Excellence and Tawanchai Foundation is established, in which they have a competency to provide multidisciplinary care as well as the ability to support transportation cost and others expenses that were excluded from hospital/government support. As a result, it leads to increases in the number of patients accessing services at Srinagarind Hospital every year.

Regarding the number of patients who received medical services and follow-ups of 3.37 visits/ person/year. It is consistent with the study of Pradabwong et al⁽¹⁰⁾ which addressed the frequency of follow-ups of 5-6 visits/person/year. The patients age ranged between 0-5 years were considered as an important period to obtain the treatments and have the highest follow-up rates compared to other ages. Responsible nurses and nurse coordinators would plan to make an appointment with patients to meet multidisciplinary team for complete health check-up within one day (One Day Service). This contributes to holistic care, reduction of wasted time, and possible transportation costs and expenses.

The patients with congenital malformations

of eyelid, lacrimal apparatus and orbit, lens malformations, malformations of ear, face, and neck, also needed the multidisciplinary team care. Tawanchai Center of Excellence, Tawanchai Foundation, Faculty of Dentistry, and nurse coordinators play a crucial role in caring, coordinating, and supporting the patients with cleft lips and palate to access treatments.

Conclusion

The evidence suggests that the majority of the patients were male. Most common type of malformations was cleft palate with cleft lip. Most of the patients received treatment during the age of 0-5 years. The highest follow-ups rate was 4.74 visits/year in the year 2011. The most common type of health coverage of the patients was Universal Health Coverage Scheme of other hospitals. Overall, the number of patients with congenital malformations of craniofacial anomalies are increasing every year.

What is already known on this topic?

Cleft lips and cleft palate are the most common type of congenital malformations of craniofacial deformities. The incidence is highest in the North Eastern of Thailand (59%).

What this study adds?

In addition to cleft lips and palate, the present study also found the co-incidence of the congenital malformations of eyelid, lacrimal apparatus and orbit which held the third highest incidence. The fifth highest incidence was lens malformations. Congenital malformations of face and neck were the sixth, and the seventh malformations of the ear while the eighth, ninth, and tenth were congenital malformations of brain, malformations of eye, and microcephaly, respectively. It can be found that the trend of patients with these malformations accessing treatment in Srinagarind Hospital is increasing every year.

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Potential conflicts of interest

None.

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การศึกษาจำนวนและแนวโน้มของผู้ป่วยโรคพิการแต่กำเนิดบนใบหน้าและกะโหลกศีรษะที่มารับการรักษาที่โรงพยาบาล ศรีนครินทร์ในระหว่างปีงบประมาณ พ.ศ. 2548 ถึง 2557

วาสนา จันทะชุม, อรทัยเล็ก บุญญาสิน, สุธีรา ประดับวงษ์, รำพรรณ ภัทรนิตย์, บวรศิลป์ เชาวน์ชื่น

ภูมิหลัง: ความพิการแต่กำเนิดของใบหน้าและกะโหลกศีรษะเกิดจากความผิดปกติของหลายระบบร่วมกัน ประกอบด้วยความพิการบริเวณใบหน้าและศีรษะ ระบบประสาทตาหูและการสบฟันเป็นต[้]นการศึกษาถึงข้อมูลพื้นฐานต่าง ๆ ของผู้ป่วยกลุ่มนี้จะเป็นหลักฐานที่สำคัญให้กับผู้ป่วย/ผู้ดูแลทีมแพทย และพยาบาลในการตัดสินใจด[้]านการดูแลรักษาผ่าตัดและฟื้นฟูสภาพรวมทั้งอาจนำไปสู่การป้องกันโรคได้ในที่สุด

วัตถุประสงค์: เพื่อศึกษาจำนวนและแนวโน้มของผู้ป่วยโรคพิการแต่กำเนิดบนใบหน้าและกะโหลกศีรษะที่มารับการรักษาในโรงพยาบาลศรีนครินทร์ วัสดุและวิธีการ: การศึกษาเป็นการวิจัยเชิงพรรณนาโดยทำการศึกษาประวัติการรักษาของผู้ป่วยที่มีความพิการแต่กำเนิดบนใบหน้าและกะโหลกศีรษะ ทุกรายด้วยรหัสโรค ICD-10 กลุ่ม Q00-Q38, Q67 และ Q75 ที่มารับการรักษาในโรงพยาบาลศรีนครินทร์ในช่วง 10 ปีที่ผ่านมา (ปึงบประมาณ 2548 ถึง 2557) ใช้แบบบันทึกในการรวบรวมข้อมูลได้แก่โรคอายุเพศภูมิลำเนาปัจจุบัน สิทธิการรักษาพยาบาลจำนวนครั้งของการมารับบริการ ใช้เวลาเก็บรวบรวมข้อมูล 6 เดือนวิเคราะหข้อมูลโดยใช้สถิติเชิงพรรณาคือร้อยละค่าเฉลี่ย

ผลการศึกษา: พบว่ามีผู้ป่วยที่มารับการรักษาในโรงพยาบาลศรีนครินทร์ในช่วง 10 ปีที่ผ่านมาจำนวน 10,272 รายเป็นเพศชายมากที่สุด (ร้อยละ 52.40) มีภาวะปากแหว่งเพดานโหว่มากที่สุด (ร้อยละ 26.64) (Q37) อยู่ในช่วงอายุ 0-5 ปีมากที่สุด (ร้อยละ 59.68) ดิดตามการรักษามากที่สุด ในปีงบประมาณ พ.ศ. 2554 จำนวนเฉลี่ย 3.74 ครั้ง/ปี อาศัยในจังหวัดขอนแก่นมากที่สุดใช้สิทธิบัตรสุขภาพถว้นหน้าโรงพยาบาลอื่นมากที่สุด (ร้อยละ 81.07) และด้านแนวโน้มมีผู้ป่วยกลุ่มนี้เพิ่มขึ้นทุกปี

สรุป: ผู้ป่วยที่มีความพิการแต่กำเนิดบนใบหน้าและกะโหลกศีรษะเป็นเพศชายมากที่สุดและพบมีภาวะปากแหว่ง เพดานโหว่พบมากที่สุดโดยเข้ารับการรักษา ในช่วงอายุ 0-5 ปีมากที่สุดจำนวนครั้งที่มาติดตามการรักษามากที่สุด อยู่ในช่วงปีงบประมาณ พ.ศ. 2554 สิทธิการรักษาส่วนใหญ่ ใช้สิทธิบัตรสุขภาพถ้วนหน้าโรงพยาบาลอื่น และในภาพรวมแนวโน้มผู้ป่วยกลุ่มนี้จะมีเพิ่มขึ้นทุกปี