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Research Article

Dental Caries Status and Relevant Factors in Children with Primary Nephrotic Syndrome in National Children Hospital, Vietnam

Abstract

Objectives: 1) To give a description for dental caries status of children suffering primary nephrotic syndrome in National Children's Hospital 2016-2017; 2) to provide a comment on mentioned-above children dental caries rate related factors.

Method: this is a descriptive cross-sectional study conducted on 236 children 6-14 years old who are diagnosed with primary nephrotic syndrome and under treatment in Department of Nephrology -Dialysis in National Children's Hospital from 11/2016 to 5/2017

Results: Caries rate of researched object is 90.7%; 6-8 group presents a deciduous teeth-caries rate of 9%, dmft index: 6.54; Group 9-11 and 12-14 presents a permanent teeth-caries of 73.4% (DMFT = 2.39) and 87.1 (DMFT = 3.58) respectively.

The patient group sufferingsteroid-resistant type presents a risk of 3.21 times higher than the group with steroid-dependent type (OR = 3.21 and 95% CI is 1.09-9.42); The group with steroid-sensitive type presents a risk of 3.03 times higher than the group with steroid-dependent type (OR=3.03 and 95%CI is 1.0 – 9.65).

Conclusions: Caries rate in children related to primary nephrotic syndrome is significantly high. Oral hygiene practice of children related to primary nephrotic syndrome is a caries rate related factor.

Introduction

Nephrotic syndrome (NS) is one of the most popular nephropathy in kids, according to statistics of National Children's Hospital, In Vietnam during decades 1981-1990 the number of NS children occupied 1.7% total in-patients, and 46.6% total patients of Nephro-Urology Department [1]. Ho Chi Minh City Children Hospital No 1 annually receives an average number of 300 NS patients, accounting for 0.7% total hospitalized children, and 38%hospitalized patients under Nephrotic diseases [2]. NS patients stand under a high recrudescence rate (55-60%) and can be resulted in extreme complications such as vasodepressor, anglemphrasis and infection etc. even resistance followed with risk of chronic renal failure requiring dialysis and kidney transplant [3], the disease often get recrudesced after aninfection. Thus, all infection contains bacterial oral contamination (caries, gingivitis, apical periodontitis, pericoronal abscess etc.) require an urgent and continuous treatment. According to Cheryl Thomas and R.D.H,

complications of chronic nephropathy will impact on hard tissue and soft tissue in oral. Oral mucosa, teeth, bone, tongue and salivary gland will be all affected by chronic nephropathy [4]. Thus, reality of caries and oral care in children suffering primary nephrotic syndrome (PNS) needs a significant notice. Therefore, we conduct this study to:

Giving a description for reality of children suffering primary nephrotic syndrome in National Children Hospital 2016-2017.

Providing some comments on factors related to caries rate of such children group.

Material and Method

The research will be conducted on 236 children diagnosed suffering primary nephrotic syndrome and being under treatment in Nephro-Dialysis Department of National Children's Hospital from 11/2016 to 5/2017. The patients will be diagnosed suffering PNS with following implications:

proteinuria \geq 50mg/kg/24 hours, blood protide < 56 g/l, blood albumin < 25 g/l [5-6].

Inclusion criteria: age from 6-14, existing primary nephrotic syndrome, engaged permit of family or elders for the research.

ICDAS 1997 based cries diagnosis was revised on 2013. Decayed-missing-filled index (DMFT): It is the total number of deciduous teeth by decayed ones + missing ones + filled ones. The decayed-missing-filled index for permanent teeth: is the total number of permanent teeth by decayed ones + missing ones + filled ones

Oral Care Practice: conducting interview with researched objects by Research Form (Table 1), then the Oral Care Practice grade will be calculated as following:

- + Total grade \leq 3 indicates an "Ill Practice"
- + Total grade \leq 3 indicates an "Good Practice"

As for PNS, we will obtain following records: disease type, disease time and recrudescence from the initial diagnoses until research and applying medicine

Figures will be processed and calculated by SPSS 16.0

Research morality: the research is permitted only with agreement of children and family. All their information will be subjected to confidence and for research purposes only.

Results

The research will be conducted on 236 children, in which 75% (177/256) is male, the the remaining 25% (59/236) female. The age range of the research are group of 6-8 years old, accounting for 24.2% (57/236), group of 9-11 years old, 46.2% (109/236), and group of 12-14 years old, 29.6% (70/236).

Caries rate of the researched objects is 90.7% (214/236 cases). 174 patients have deciduous teeth, in which 136 patients get caries, accounting for 78.2%. Permanent caries rate is 164/236, accounting for 69.5% (Chart 1).

Caries rate of 6-8 group is 94.7% (54/57 cases), 9-11 group 90.8% (99/109 cases) and 12-14 group 87.1% (61/70 cases). The difference, however, is unmeaning for statistics with $p > 0,05$ (test χ^2) (Chart 2).

Among 236 patients, 174 have deciduous teeth, average dmft is 3.98. Averagely each patient has 3.91 decayed deciduous teeth, namely:

- dmft index of 6 - 8 group is 6.56. Each patient has averagely 6.51 decayed deciduous teeth. No deciduous tooth loses by caries
- dmft index of group 9 - 11 is 2.82. Each patient has averagely 2.73 decayed deciduous teeth.
- dmft index of group 12 - 14 is 1.67. Each patient has averagely 1.67 decayed deciduous teeth (Table 2).

Totally 236 researched patients all have permanent teeth.

Table 1: Grade calculation of Oral Care Practice.

No	Questions	Answers	Grade
1	Teeth brushing frequency	≥ 2	1
		<2	0
2	Having private brush	Yes	1
		No	0
3	Brushing duration	≥ 3	1
		<2	0
4	Brushing method of children	"Brushing all 3 sides" or "brushing slowly and in a circle motion" or "Brushing vertically and slowly"	1
		"Brushing hastily and horizontally" or "Brushing horizontally and slowly" or "Forget, have no idea"	0
5	Post-meal brushing	Yes	1
		No	0
6	Suffering a toothache in the past	No	1
		Yes or forget	0

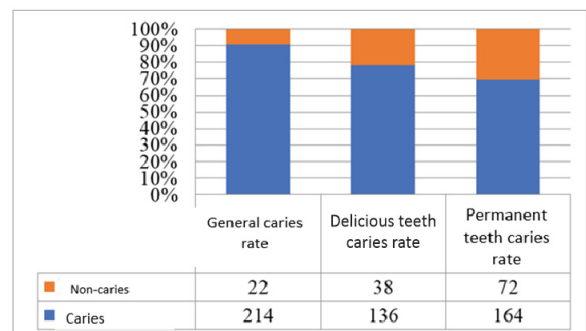


Chart 1: Caries prevalence of the researched objects.

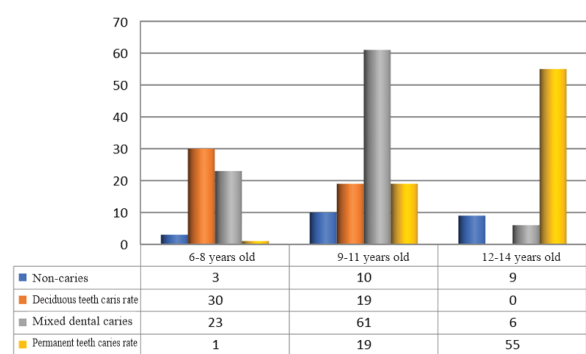


Chart 2: Decayed teeth types by age groups.

DMFT of the researched objects is 2.42, indicating an average number of 2.36 decayed permanent teeth for each patient. Number of patients with missing or filled teeth due to caries is insignificant.

Specifically

- Group 6-8 has the lowest DMFT 1.05, indicating an average number of 1.05 decayed permanent teeth for each patient. No case with missing or filled teeth due to caries.

- Group 9-11 has DMFT index 2.39, indicating an average number of 2.3 decayed permanent teeth for each patient.

- Group 12-14 has the highest DMFT index 3.58. Indicating an average number of 3.5 decayed permanent teeth for each patient. (Table 3).

Oral care practice is relevant to dental caries status. Particularly, caries rate in the Ill practice group is significantly higher than the Good practice group. Such difference presents a statistical meaning with $p < 0.05$ (fisher's exact test) (Table 4).

Relationship between dental caries with primary nephrotic syndrome

- Existing a statistical meaning difference between disease type and dental caries status. The patient group with steroid-resistant type presents a dental risk of 3.21 times higher than times higher than the group with steroid-dependent type (OR = 3,21 and 95% CI is 1,09-9,42); The group with steroid-sensitive type presents a risk of 3.03 times higher than the group with steroid-dependent type (OR=3,03 and 95%CI is 1,0 - 9,65).

- The patient group with treatment period more than 5 years presents a dental caries risk of 1,95 times higher than the group with treatment period under 5 years. However, the difference is not statistically significant.

- the patient group being under treatment course presents a dental caries risk of 1.47 times higher than the treatment-paused group. However, the difference is not statistically significant.

- The cycloporine -used patient group has a dental caries risk of 1.53 higher than the cycloporine-unused group. However, the difference is not statistically significant.

The patient group with recrudescence frequency 1-3 times presents a dental caries risk of 3.19 times higher than the group with initial caries. The group with recrudescence frequency more than 3 times has a dental caries risk more than 2.04 times the group with initial caries. However, such difference is without statistical meaning (Table 5).

Discussion

Characteristics of the researched objects

We divided the researched objects into 3 age groups: 57 patients are of group 6-8 years old, accounting for 24,2%, 109 of group 9-11, 43.2%, 70 patients of group 12-14, 29.6%. In which 177 patients are male, 59 females, such fact matched with nephrotic syndrome epidemic, the ratio between male/female children is 3/1 [7].

Dental caries rate in researched objects

The research indicates the dental caries rate of 90.7% (Chart 1) which is ranked to the top class.

Deciduous teeth caries rate of group 6-8 is the highest one (93%), lowered to 73.4% in the group 9-11 and 8.57% in the group 12-14. These results are generally higher than the national oral health survey results in 2002 of Vietnam by Tran

Table 2: Decayed-missing-filled teeth index (dmft) by age group.

Age groups	dmft			
	dt	mt	ft	dmft
Group 6-8 (n=57)	6.51	0	0,05	6.56
Group 9-11 (n=108)	2.73	0.03	0,06	2.82
Group 12-14 (n=9)	1.67	0	0	1.67
Total (n=174)	3.91	0.02	0.05	3.98

Table 3: Decayed-missing-filled (DMFT) teeth index by age groups.

Age group	DMFT			
	DT	MT	FT	DMFT
Group 6-8 (n=57)	1.05	0	0	1.05
Group 9-11(n=109)	2.3	0	0.09	2.39
Group 12-14 (n=70)	3.5	0,01	0.07	3.58
Total (n=236)	2.36	0.001	0.06	2.42

Table 4: Relationship between dental caries and Oral care practice.

Oral care practice	Dental caries		p
	Non-caries	Caries	
Good practice	16 (100%)	0 (0%)	0,0001
Poor practice	6 (2.7%)	214 (97.3%)	

Van Truong and Lam Ngoc An: Deciduous teeth caries rate in 6-8 children was 84.9%, in 9-11 56.3% [8].

Permanent teeth caries rate of the group 6-8 is 42.1%; group 9-11 73.4% and the highest, 78.1%, is of group 12-14. These results matches with that of Tran Van Truong 2002, permanent caries rate is different between the groups and increases gradually by age [8] which can be explained by accumulation by time of dental caries.

In comparison with results of Tran Van Truong and indexes in 12 provinces and cities over the country in 2002 [8], as well as results of Nguyen Anh Son's research (Deciduous teeth caries rate: 67.2%, Permanent teeth caries rate: 59.2%) [9], the various dental caries rates in our research are all higher. It is due to our nephrotic syndrome-related researched subject we chose, partly comes from side-effect of xerosfomia-causing medicament which reduces saliva flow and causes dental plate accumulation. This is a risk factor causing dental caries rate increase. In addition, because of PNS of the children in this research, families just focus on body disease while the oral care practice is neglected. These results matches with study of Anna Piróget. al (2012) conducting study of a disease group upon 60 children (8,4 ± 4,6 years old) suffering nephrotic syndrome and the control group with 55 children at the same age (10,04 ± 4,79 years old) without other chronic diseases or using medicine in long-term [10]. The results indicate that general dental caries rate in PNS group is higher than the control group, leading the authors to the conclusion that all PNS children suffer a dental caries risk higher than the normal.

Decayed-missing-filled teeth index of the researched objects

Untreated decayed deciduous teeth index of the PNS children is rather high (3,91), treated rate (including dental extraction and filling) is very low (0.07). Thus, PND children

Table 5: Relationship between dental caries and PNS characteristics.

Some PNS characteristics		Non-caries		Caries		OR (95% CI)	p
		n	%	n	%		
Nephrotic syndrome type	Dependent type	8	19.5	33	80.5	1	0.04
	Resistant type	8	7.0	106	93.0	3,21 (1.09 – 9.42)	
	Sensitive	6	7.4	75	92.6	3,03 (1.0 – 9.65)	
Treatment period	≤ 5 years	17	11.1	136	88.9	1	0.2
	> 5 years	5	6.0	78	94.0	1.95 (0.69 – 5.52)	
Treatment status	Under treatment	21	39.5	200	90.5	1	0.58
	Treatment stopped	1	6.7	14	93.3	1.47 (0.18 – 11.8)	
Medicament	Cyclosporine-used	13	11.1	104	88.9	1	0.35
	Cyclosporine-unused	9	7.6	110	92.4	1.53 (0.62 – 3.74)	
Frequency of recurrence	Initial	5	17.9	23	82.1	1	0.12
	1 – 3 times	6	6.4	88	93.6	3.19 (0.87 – 11.7)	
	> 3 times	11	9.7	103	90.3	2.04 (0.64 – 6.49)	

suffer a high risk and incidence of dental caries without a worth concentration of treatment. If such fact remains, masticatory force, permanent jaw quality and development, as well as treatment performance of existing disease will be impacted significantly.

Table 3 shows DMFT of the researched group 2.42, averagely each patient has 2.36 decayed permanent teeth. This result is higher than that of Nguyen Thu Hang's research 2013 upon 12 Vietnamese children with DMFT 1.49 [11]. In this research, DMFTs present a difference and takes an increase by age groups. This is explained by the fact that the more children grow, the higher exposure time to risk factor is, leading to an increase of dental caries accumulation. Permanent teeth caries rate in NS children in our research is 69.5%, really being a social concerned problem.

Relationship between dental caries and oral care practice

Oral care practice is relevant to dental caries status. Particularly, 100% patient if good practice group have not dental caries at all, while 97.3% patient in the ill practice suffer dental caries. Such difference bears a statistical meaning with $p < 0.05$ (fisher's exact test) (Table 4).

Relationship between nephrotic syndrome characteristics and dental caries status

Existing a statistical meaning difference between disease type and dental caries status. The patient group with steroid-resistant type presents a dental risk of 3.21 times higher than times higher than the group with steroid-dependent type (OR = 3,21 and 95% CI is 1,09–9,42); The group with steroid-sensitive type presents a risk of 3.03 times higher than the group with steroid-dependent type (OR=3,03 and 95%CI is 1,0 – 9,65). Steroid-resistant type and sensitive type increase dental caries risk mainly due to an ill oral hygiene practice, and further due to ill enamel or xerostomia increasing dental caries rate.

Conclusion

Dental caries rate in children suffering primary nephrotic syndrome is significant high. Oral care practice and nephrotic syndrome type are relevant to dental caries rate.

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