Orthodontic Treatment Standard in Specialist and Non-specialist practices in Latvia

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SUMMARY

Orthodontic treatment in Latvia has been provided both by specialists and non-specialists. Because of the diversity in the provision of orthodontic care, a reasonable question in whether there is an identifiable correlation between specialist and non-specialist treatment standard. The aim of this study was to assess initial malocclusion severity and occlusal outcome in specialist and non-specialist settings using the Index of Complexity, Outcome and Need (ICON). Samples used in this study for group 1 – treated in non-specialist practice were collected from dental practice in Liepāja (n = 26) and for group 2 – treated in specialist practice – from the Orthodontic Clinic of Institute of Stomatology (n=30).

There were no statistically significant differences in treatment need between cases treated in specialist clinic and non-specialist practice. However there was difference in treatment outcome scores between both groups – 25,6 in group 1 and 18,9 in group 2 (p = 0,02). Considering complexity and acceptability of treated cases, there were no statistically significant differences. The only difference was in improvement category. In group 2 out of 30 cases 14 were considered as greatly improved compared to group 1 where only 3 cases out of 26 were greatly improved.

Key words: orthodontic treatment, treatment indices.

INTRODUCTION

Quality of care has been defined as "the degree to which health services for individuals and population increase the likelihood of desired health outcomes, consistent with current professional knowledge". [1]

In orthodontic quality of treatment is not consistently measured, partly because of the inherent difficulty involved. [2]

Orthodontic treatment in Latvia has been provided partly by specialists in orthodontic clinic and private practices localized in the capital city – Riga and nearly it. The other part is general practitioners – non - specialists who provide orthodontic treatment in other urban and rural settings of the country. The orthodontic care is fully financed by patients themselves. Because of the diversity in the provision of orthodontic treatment, a reasonable question is whether there is an identifiable correlation between specialist and non - specialist treatment standard.

The present study aimed to assess initial malocclusion severity and occlusal outcome in specialist and non- specialist practise using internationally developed index – ICON.

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MATERIALS AND METHODS

Many factors can be considered when assessing quality of orthodontic care such as patient satisfaction, aesthetic, function, stability and occlusal result. A comprehensive evaluation would have to consider all of these factors, but the only systematic, widely accepted measurement systems are indices of mallocclusion. There have been many indices employed in accessing orthodontic treatment need and outcome.[3; 4]

ICON is recently internationally developed occlusal index for measuring treatment complexity, outcome and need.[5] It incorporates features of previous indices such as the Index of Orthodontic Treatment Need and the PAR index. The ICON score is recorded both on pre and post treatment models.(Fig. 1) Samples for group 2 – treated by orthodontic specialist were collected from the Orthodontic Clinic of Institute of Stomatology (n = 30). Samples for group 1 – Treated by non-specialist – were collected from dental practise in Liepāja (n = 26).

Statistical analyses

One of the authors was calibrated in the use of the ICON index using 30 "gold standard" cases.

Descriptive statistics were used to access mean ICON values in each of the groups. The need for orthodontic treatment defined having ICON score 44 and greater. The outcome of orthodontic treatment defined having ICON score 30 and less. Two sample t test with equal variances was used to access treatment

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need and outcome results between two groups, as well as to compare the mean age of the patients between groups. Chi 2 test were used to access orthodontic treatment complexity, acceptability and improvement grade between both groups. The level of significance for all tests was set p = 0,05.

RESULTS

The examiner was calibrated in the use of the ICON with mean difference from the gold standard less than 5 ICON points and the Root Mean Square less than 9 ICON points.

The results for the ICON scores and mean patient age are shows in Table 1 and 2. The average age at the start of treatment in group 1 (treated by non-specialist) was 12,2 years (range 9-14), but in group 2 (treated in specialist clinic) it was 15,8 years (range 11-38) respectively.

The mean ICON score in group 1 at the start was 68,3 (range 44-96) and on complection – 25,6 (range 14-49).

The mean ICON score in group 2 at the start was 68,5 (range 21-98) and on complection 18,9 (range 7-46) accordingly.

When analysing orthodontic treatment need between two groups (table 3) the difference in mean ICON values is not statistically significant. Nevertheless when looking for differences of ICON mean scores after treatment in both groups (table 4) the results are statistically significant – 25,6 in group 1 and 18,9 in group 2 (p = 0,02).

Complexity and need

In group 1 all 26 cases fell in the category of needing treatment. In group 2 two cases out of 30 were considered as not needing treatment (table 5).

Considering complexity in group 1 16 cases fell into the difficult or very difficult categories, and 17 cases in group 2 respectively (table 6).

Improvement and acceptability

There was not statistically significant difference in treatment acceptability categories between groups (table 7).

The only significant difference was in improvement categories (table 8). In group 2 (treated in specialist clinic) out of 30 cases 14 were considered as greatly improved compared to group 1 (non – specialist treatment) where only 3 cases out of 26 were greatly improved.

Table 1. *Patients mean age and ICON scores before and after treatment non-specialists cases.*

Variable	Sample case	Mean	Std. Dev.	Min	Max
Age	26	12,23	1,34	9	14
ICON bef	26	68,31	13,10	44	96
ICON aft	26	25,62	6,94	14	49

Table 2. *Patients mean age and ICON scores before and after treatment specialists cases.*

Variable	Sample case	Mean	Std. Dev.	Min	Max
Age	30	15,8	6,20	11	38
ICON bef	30	68,53	16,61	21	98
ICON aft	30	18,97	8,32	7	46

Table 3. *ICON before treatment in both groups.*

Variable	Mean	Std. Err.	T	P> /t/	95% Conf	Interval
1	68,31	2,57	26,59	0,0000	63,02	73,60
2	68,53	3,03	22,60	0,0000	62,33	74,73
Diff	-, 23	4,041	-,06	0,95	-8,33	7,88

* no significant difference

Table 4. *ICON after treatment in both groups.*

Variable	Mean	Std. Err.	T	P> /t/	95% Conf	Interval
1	25,62	1,36	18,82	0,0000	22,82	28,42
2	18,97	1,52	12,48	0,0000	15,86	22,07
Diff	6,65	2,07	3,22	0,0022	2,50	10,79

Table 5. *Need for treatment.*

	Group 1	Group 2	Total
No need	0	2	2
	0,00	100,00	100,00
	0,00	6,67	3,57
> 43 need treatment	26	28	54
	48,15	51,85	100,00
	100,00	93,33	96,43
Total	26	30	56
	46,43	53,57	100,00
	100,00	100,00	100,00

Table 6. *Acceptability of end result.*

	Group 1	Group 2	Total
No need	4	1	5
	80,00	20,00	100,00
	15,38	3,33	8,93
Acceptable < 31	22	29	51
	43,14	56,86	100,00
	84,62	96,67	91,07
Total	26	30	56
	46,43	53,57	100,00
	100,00	100,00	100,00

Table 7. *Complexity of treated cases in specialist and non-specialist practice.*

	Group 1	Group 2	Total
Easy < 29	0	1	1
	0,00	100,00	100,00
	0,00	3,33	1,79
Mild 29-50	1	1	2
	50,00	50,00	100,00
	38,5	3,33	3,57
Moderate 51-63	9	11	20
	45,00	55,00	100,00
	34,62	36,67	35,71
Difficult 64-77	10	9	19
	52,63	47,37	100,00
	38,46	30,00	33,93
Very difficult > 77	6	8	14
	42,86	57,14	100,00
	23,08	26,67	25,00

Component 1. *Aesthetic Assessment.*

COMPONENT				SCORE			Weight
	0	1	2	3	4	5	
1. Aesthetic assessment	Score 1-10						7
2. Upper arch crowding	< 2 mm	2.1 to 5 mm	5.1 to 9 mm	9.1 to 13 mm	13.1 to 17 mm	> 17 mm	5
Upper arch spacing	< 2 mm	2.1 to 5 mm	5.1 to 9 mm	> 9 mm		Impacted tooth	5
3. Corssbite	Not present	present					5
4. Incisor open bite	Complete bite	< 1 mm	1.1 to 2 mm	2.1 to 4 mm			4
Incisor overbite	< 1/3 lower incisor covered	1/3 to 2/3 covered	2/3 up to fully covered	Fully covered			4
5. Buccal segment antero-posterior	Cusp to embrasure noly; Class I; II or III	Any cusp relation up to but not including cusp to cusp	Cusp to cusp				3

Table 8. *Improvement grade of cases treated in specialist and non-specialist practise.*

	Group 1	Group 2	Total
Greatly improved	3	14	17
	17,65	82,35	100,00
	11,54	46,67	30,36
Substantially	7	7	14
	50,00	50,00	100,00
	26,92	23,33	25,00
Moderately improved	12	6	18
	66,67	33,33	100,00
	46,15	20,00	32,14
Minimally improved	3	2	5
	60,00	40,00	100,00
	11,54	6,67	8,93
Worse	1	1	2
	50,00	50,00	100,00
	3,85	3,33	3,57
Total	26	30	56
	46,43	53,57	100,00
	100,00	100,00	100,00

DISCUSSION

The results show that according to ICON mean scores there is no difference in treatment need, complexity and outcome values between individuals treated in specialist clinic or by non – specialist. Permert at all in their study also found that GDP's diagnosed malocclusions and estimated the need for treatment accurately.[6] On the otherhand Lagerstrom et all stated that there are qualitative differences between specialist and non – specialist based treatment.[7] We can draw parallels with our study considering treatment improvement grade. The difference between cases treated by specialist and non – specialist was statistically significant.

The other factor, which differ much between groups, was patients age at the start of treatment showing that in specialist clinic the treatment is carried out more in older age. These finding are in agreement with other investigations [7; 8].

The higher improvement can be explained with the appliance type used in treatment. As non – specialists tend that patients at early age and to use more removable and one arch fixed appliance which are considered not to be so effective as two arch fixed appliance [9; 11].

Radnic suggests that specialists training is needed to provide a high level of expertise in then effective efficient use of orthodontic appliances.[10]

One of shortcomings could be the small sample size as obtaining the adequate size was not easy. Clinicians may sometimes feel vulnerable when outsiders are permitted free selection of cases. Also the retrospective nature of the investigation sample can only be assumed to be broadly representative of the situation.

CONCLUSIONS

The results of our investigation suggest that orthodontic treatment is provided to patients who are in need of such treatment equally by specialists and non – specialists. The complexity and acceptability of treated cases are the same. Patients treated and acceptability of treated cases are the same as in orthodontic specialist clinic. Patients treated by non – specialist are younger. The improvement grade of treated cases in non – specialists practise is lower than in specialist clinic.

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