



A Prospective Study on Oral Health Status of Nasopharyngeal Carcinoma patients

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INTRODUCTION

Nasopharyngeal carcinoma (NPC) is a common head and neck tumour among Southern Chinese¹. The primary treatment of NPC is by radiotherapy because the tumour is highly radiosensitive. Oral complications including xerostomia, mucositis and dental caries are common after treatment¹. In recent years, the use of adjunctive chemotherapy has been widely adopted in treating NPC especially in advanced cases. To our knowledge, no data were available comparing oral health changes in NPC patients after treatment of radiotherapy alone and after radiotherapy plus chemotherapy.

AIM

A longitudinal study to compare the oral health status of NPC patients receiving irradiation only (RT) and irradiation plus chemotherapy (RTCH)

MATERIALS AND METHODS

Subjects

- 45 patients newly diagnosed with NPC were recruited from the Queen Mary Hospital, Hong Kong
- Before NPC therapy, all patients received comprehensive primary dental care. Fluoride carriers and jaw opening exercises were prescribed
- Patients who had history of chemotherapy or radiotherapy in head and neck region were excluded

Saliva collection and analysis

- Stimulated whole saliva (SWS): chewing a rubber ring for 5min
- Stimulated parotid saliva (SPS): chewing a rubber ring and application of 0.1ml 2% citric acid on tongue at 3min intervals for 15min, collected using a Lashley cup (Fig. 1) secured over a parotid duct
- Saliva volume, pH and buffer capacity were measured

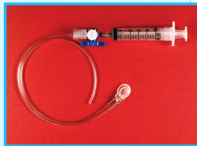


Fig. 1

Clinical examination

- Single examiner (EHNP) who was blinded to the treatment modalities
- Jaw opening, mucositis score², xerostomia index (XI)³, plaque score, CPI, loss of attachment, DMFT, prosthetic status and need (WHO oral health assessment)
- Evaluation points: prior to and 2- and 6-month after treatment

Data analysis

- Paired sample T, Wilcoxon signed ranks tests to compare changes over time. Independent sample T, Mann-Whitney, Chi-square tests to compare differences between groups. 5% level of significance was used

RESULTS

- 39 out of 45 patients completed the study. Two died, two withdrew from the study and two lost contact.

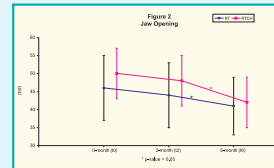
Baseline data before treatment

	RT	RTCH
Number	20	19
*Age (mean, SD)	51 (11)	43 (9)
Gender (M, F%)	85, 15	84, 16
*Tumour stage (S1, S2, S3, S4%)	5, 65, 20, 10	0, 26, 26, 48
RT dose (mean, SD cGy.)	7600 (523)	7326 (612)
Jaw opening (mean, SD mm)	46 (9)	50 (10)
Xerostomia index (X0, X1, X2, X3%)	95, 5, 0, 0	90, 10, 0, 0
*SWS (mean, SD ml/min)	0.6 (0.3)	1.1 (0.6)
SPS (mean, SD ml/min)	0.2 (0.2)	0.2 (0.2)
pH of SWS	7.2 (0.5)	7.3 (0.3)
Buffer capacity of SWS (high, medium, low %)	70, 25, 5	84, 16, 0
Mean % of sites with plaque	57	54
Highest CPI (1, 2, 3, 4%)	0, 42, 32, 26	0, 42, 47, 11
Highest LOA (0, 1, 2, 3, 4%)	37, 42, 11, 5, 5	42, 32, 16, 10, 0
DMFT (mean, SD)	9.5 (8.3)	7.9 (7.9)
Decayed (mean, SD)	1.1 (1.5)	0.5 (1.0)
Missing (mean, SD)	7.1 (7.8)	4.5 (6.0)
Filled (mean, SD)	1.3 (1.6)	2.9 (3.4)
Prosthetic status (with prosthesis, U, L%)	10, 5	16, 16
Prosthetic need (prosthesis required, U, L%)	40, 30	16, 31

*sig. diff., p-value <0.05

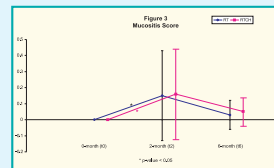
Jaw opening

- Significant reduction in jaw opening was found in both groups between the 2-month and 6-month evaluation point (p<0.05). There was no difference between groups (Fig. 2)



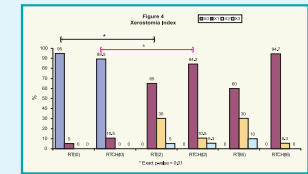
Mucositis

- Mucositis was found in both groups between baseline and the 2-month evaluation point (p<0.05). There was no difference between groups (Fig. 3).



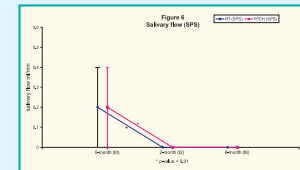
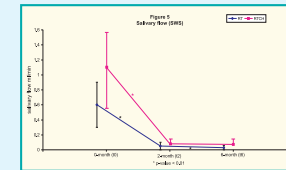
Xerostomia

- Significant xerostomia was found in both groups between baseline and the 2-month evaluation point (p<0.01). There was no difference between groups (Fig. 4).



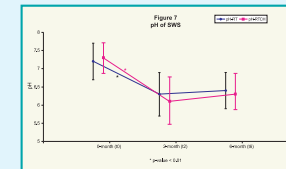
Salivary flow

- Significant reduction in SWS and SPS was found in both groups between baseline and the 2-month evaluation point (p<0.01).
- Significant reduction of SWS was found in RT group between the 2-month and 6-month evaluation point (p<0.01).
- No difference in salivary flow was found between groups (Fig. 5-6).



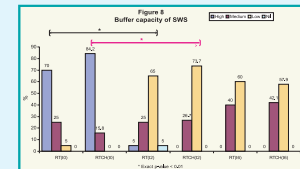
Saliva pH

- Significant drop of pH value was found in both groups between baseline and the 2-month evaluation point (p<0.01). There was no difference in pH between groups (Fig. 7).



Saliva buffer capacity

- The buffer capacity was compromised in both groups between baseline and the 2-month evaluation point (p<0.01). There was no difference in buffer capacity between groups (Fig. 8).



There were no significant changes in plaque scores, periodontal status, DMFT, prosthetic status and need in both groups between the 2 and 6-month evaluation point.

DISCUSSION

- Both treatments for NPC patients resulted in mucositis, reduction in jaw opening, and compromised saliva quantity and quality that was similar between groups.
- Both treatments had minimal effects on periodontal tissues.
- There was no change in prosthetic treatment need in both groups.

CONCLUSION

In this short term study, both treatments had minimal effect on dental tissues. This may be attributed, at least in part, to the prior oral health programme. However, xerostomia and soft tissue damage were a problem in both groups. The study is on-going and may reveal a greater impact on dental tissues in the longer term.

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