VO-15

Oral Health Status of Chinese Diabetic Patients in Hong Kong

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Introduction

- In Hong Kong, prevalence of diabetes mellitus

Age	Female	Male
25-34	1.4%	2.0%
65-74	29.3%	21.7%

- Prevalence of DM in working adults is 5%
- Average 10% of the adult population in Hong Kong are diabetics, 97% type 2
- ‘Diabetic epidemic’ as a threat to health care of developing countries e.g. India and China (King & Rewers 1993)
- Periodontal disease as one of diabetes complications. (Löe 1993)
- Diabetic complications affect quality of life of patients (UKPDS 1999) and increase the public health cost in management of diabetes mellitus

Aim

- To describe and analyze the oral health status, particularly periodontal status of predominately low income, middle age to elderly Chinese type 2 diabetic subjects in Hong Kong
- To assess to what extent periodontal destruction is associated with diabetes mellitus in the population studied?

Method

- Convenient sampling of all Chinese patients aged 41-84 years-old attending Monday clinic, Diabetes Mellitus Centre, Tung Wah Eastern Hospital
- Age- and sex-matched control subjects without major systemic conditions who attended the Monday General Out-patient Department, Tung Wah Eastern Hospital
- Medical team members responsible for subject recruitment
- Examiners were blind to grouping of subjects
- Survey took 8 weeks to finish

- Medical History
  - Diabetic history – age of onset, duration of diabetes, current HbAlc level
- Social History
  - Education level, income, smoking habit
- Dental History
  - Dental attendance, toothbrushing habit

- Oral Examination
  - DMFT, CPI (WHO 1997); ALoss (Corbet et al. 2001)
  - Denture status
- Calibration done on 10% subjects surveyed

	Kappa/Adjusted Kappa	
DMFT	0.83	Very Good
CPI	0.79, 0.76, 0.69	Good
ALoss	0.90, 0.86, 0.83	Very Good

Data Analysis

- Modified considerable attachment loss categorization (Corbet et al 2001)

age group (yr)	ALoss scoreable ≧ x sextants	ALoss score of ≧ y in ≧ z sextants	
< 45	**4**	**1**	**2**
	3 or less	**1**	**1**
45 - 64	**4**	**1**	**3**
	3 or less	**1**	**2**
	3 or less	**2**	**1**
65 - 74	**4**	**2**	**2**
	3 or less	**2**	**1**
75 - 84	**4**	**2**	**3**
	3 or less	**2**	**2**
	3 or less	**3**	**1**

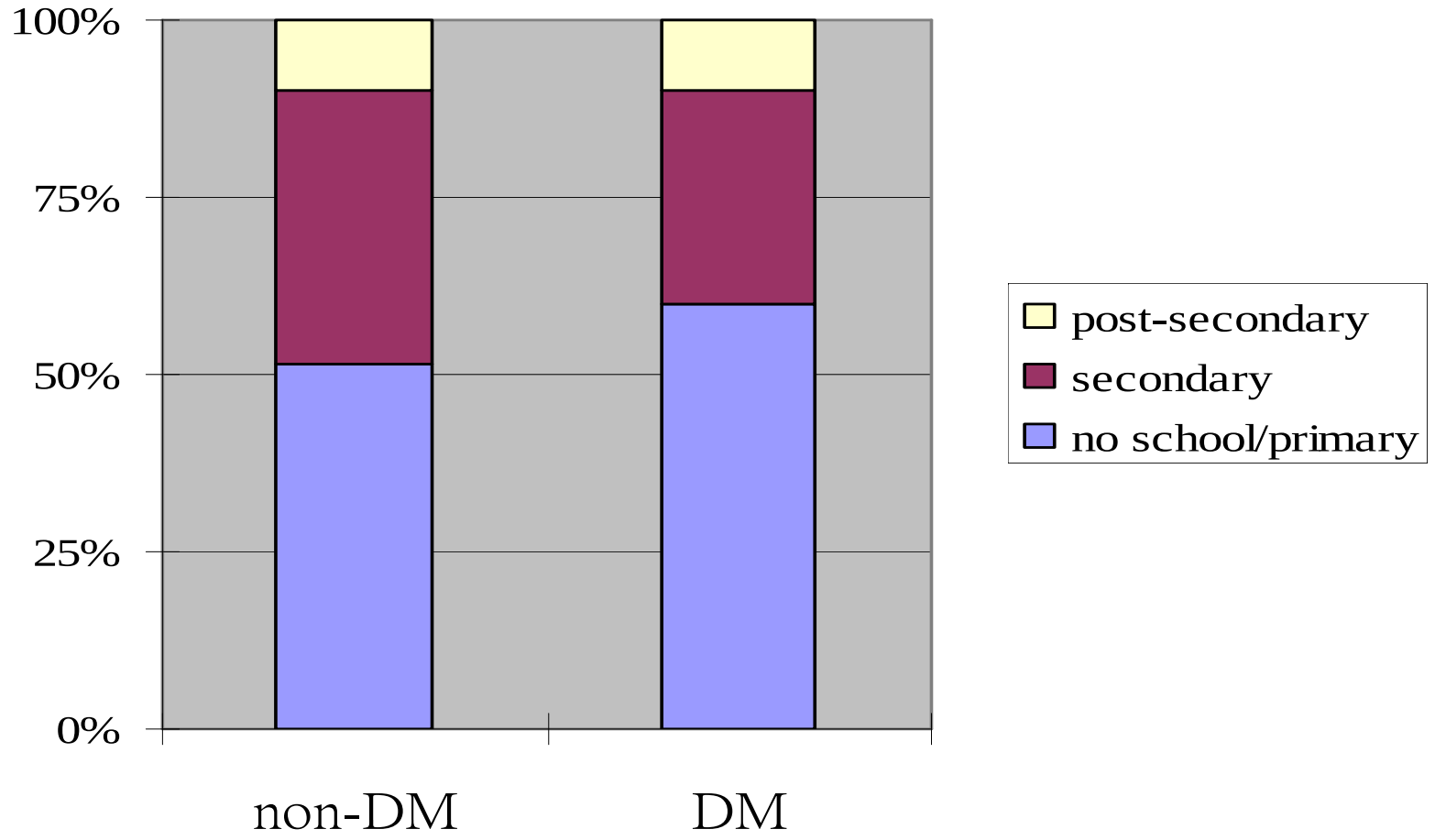
- Date Analysis
  - Fisher Exact test
  - Multiple comparison with Bonferroni adjustment
  - Linear multiple regression

Results and Discussion

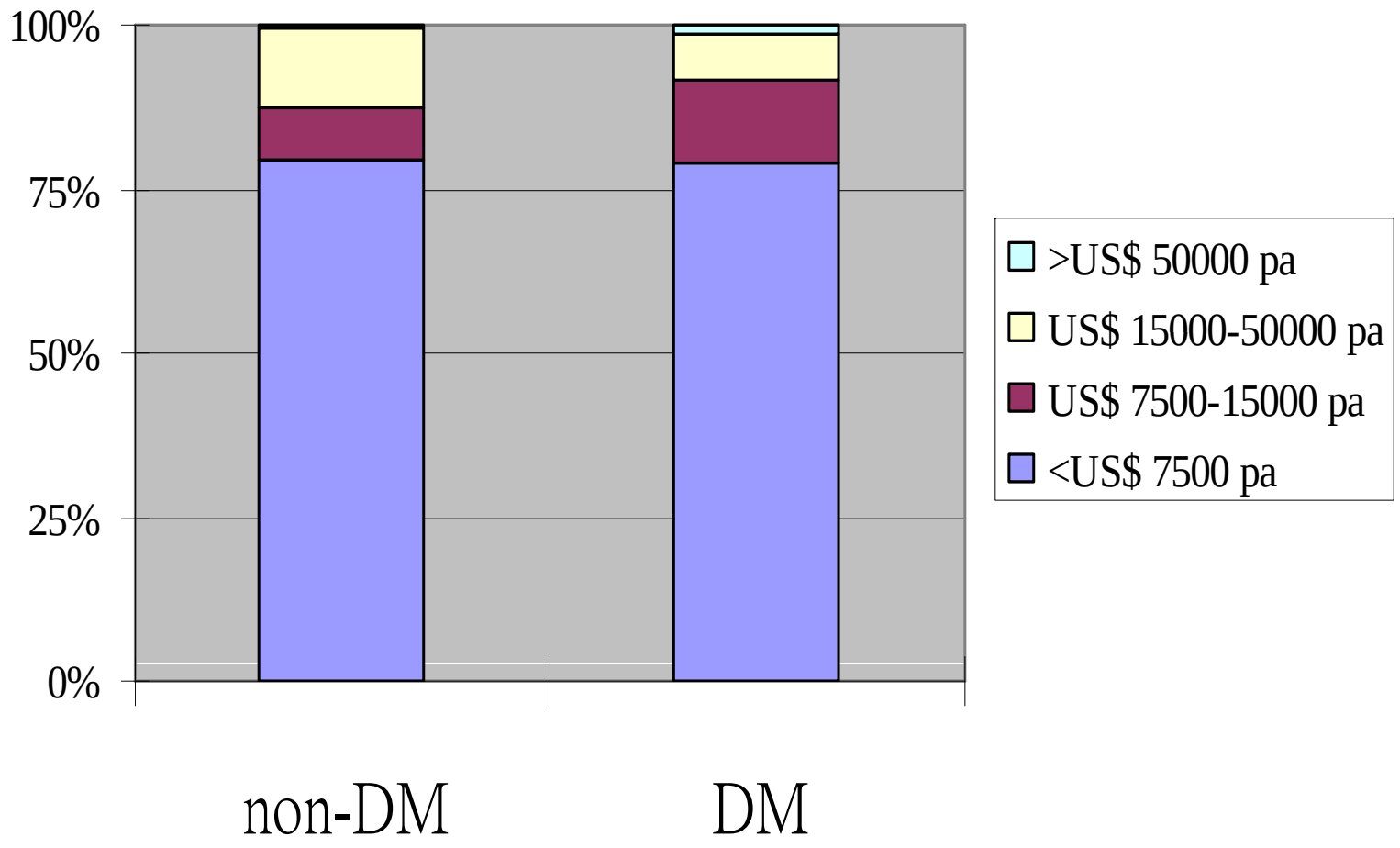
Demographic data and dental attendance of subjects

	Diabetic status	n	age	Last dental visit (Yr)
Men	DM	169	62.1 ± 10.6	2.5 ± 1.4
	Non-DM	75	64.4 ± 11.1	2.7 ± 1.2
Women	DM	195	64.9 ± 9.4	2.3 ± 1.4
	Non-DM	86	63.8 ± 10.2	2.3 ± 1.2
Total	DM	364	63.6 ± 10.1	2.4 ± 1.4
	Non-DM	161	64.1 ± 10.6	2.5 ± 1.2

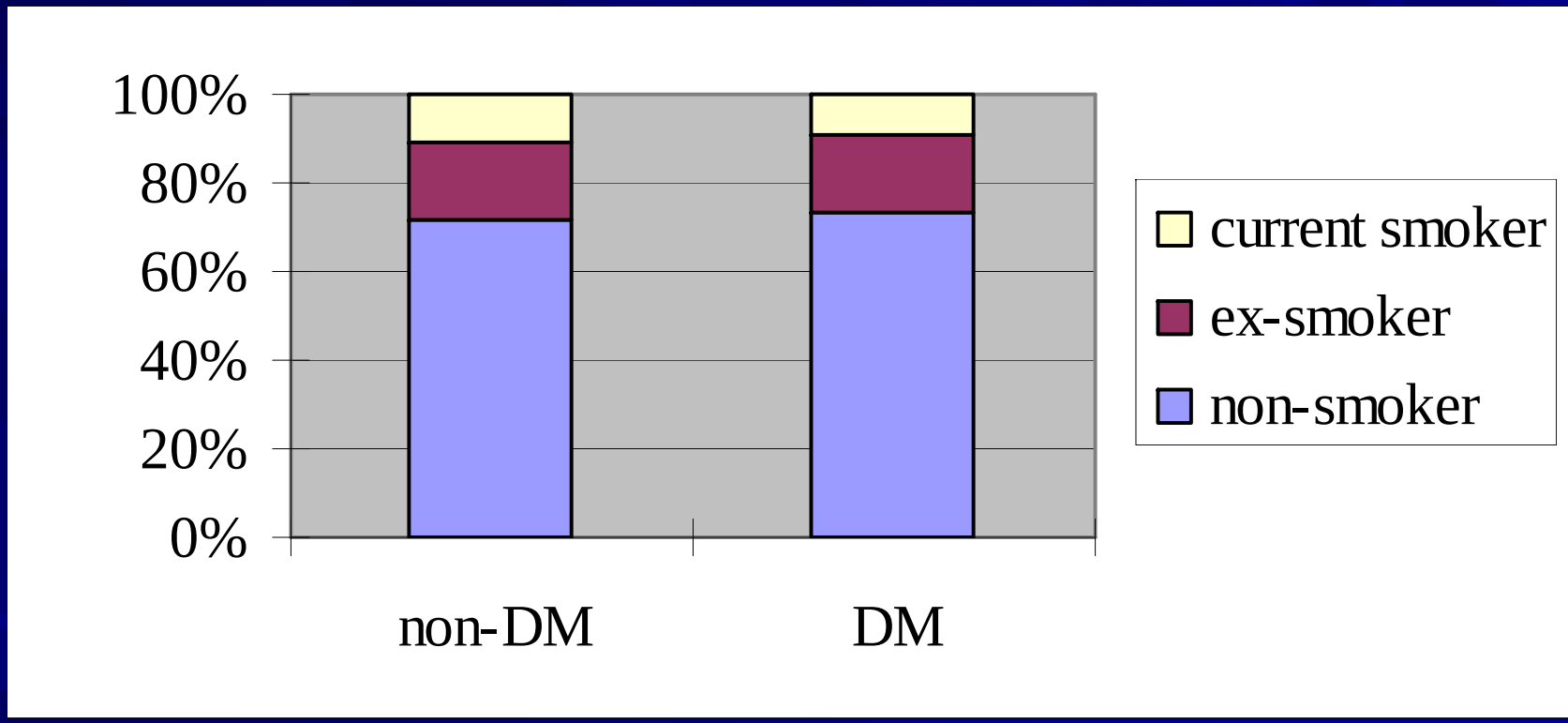
Education Level



Income


100%
75%
50%
25%
0%
non-DM
DM
>US$ 50000 pa
US$ 15000-50000 pa
US$ 7500-15000 pa
<US$ 7500 pa

Smoking Habit



Diabetic history of subjects

		Age of onset		Time since DM diagnosis		HbA1c	
	n	(year)	SD	(year)	SD	%	SD
Men	169	55.3	11	6.8	6.4	7.8	1.3
Women	195	55.9	10.5	8.9[a]	7	8	1.3
Total	364	55.6	10.7	8	6.8	7.9	1.3

[a] P<0.005, unpaired t-test

Caries experience (mean values) of subjects according to gender and diabetic status

	Diabetic status	n	% with DMFT >0	DT	MT	FT	DMFT	DMFT (SE)
Men	DM	169	98	1.4	12.2	1.6	15.2	0.8
	Non-DM	75	97	2.4[a]	9.2	1.5	13.2	1
Women	DM	195	100	1.2	15.3[b]	1.6	18.1[c]	0.6
	Non-DM	86	100	1.7	11.7	2.3	15.7	0.9
Total	DM	364	99	1.3[d]	13.9[e]	1.6	16.8[f]	0.5
	Non-DM	161	99	2.1	10.5	2	14.5	0.7

[a] Non-DM men vs DM men, Bonferroni multiple comparison, $P<0.05$

[b] DM women vs Non-DM women or DM men, Bonferroni multiple comparison, $P<0.05$

[c] DM women vs DM men, Bonferroni multiple comparison, $P<0.05$

[d] $P<0.001$, [e] $P<0.0005$, [f] $P<0.05$, unpaired t-test

Proportion of edentulous subjects

	Diabetic status	n/Total	% Edentulism
Men*	DM	18/169	10.7
	Non-DM	2/75	2.7
Women*	DM	29/195	14.9
	Non-DM	3/86	3.5
Total*	DM	47/364	12.9
	Non-DM	5/161	3.1

*DM vs non-DM group, Fisher exact test, $P<0.05$

Percentage distribution of subjects according to highest CPI or ALoss score (by sextant)

		Diabetic status	n	Percentage subjects with highest score				
				0	1	2	3	4
CPI	**Men**	DM	147	0	0	9.5	34	56.5
		Non-DM	72	0	0	11.1	48.6	40.3
	Women	DM	161	0	0	12.4	44.1	43.5
		Non-DM	81	0	0	13.6	54.3	32.1
	Total	DM	308	0	0	11	39.3	49.7*
		Non-DM	153	0	0	12.5	51.6	35.9
ALoss	**Men**	DM	145	8.3	33.1	36.6	17.2	4.8
		Non-DM	72	4.2	43.1	37.5	9.7	5.6
	Women	DM	158	10.1	46.2	30.4	8.9	4.4
		Non-DM	78	17.9	52.6	23.1	6.4	0
	Total	DM	303	9.2	39.9	33.3	12.9	4.6
		Non-DM	150	11.3	48	30	8	2.7

* Significantly more subjects in DM group having highest CPI as 4, Chi square test, $P<0.02$

Mean numbers of sextants with different levels of CPI and ALoss scores

		Diabetic status	n	Mean number of sextants with score					
				0	1+2+3+4	2+3+4	3+4	4	X
CPI	**Men**	DM	147	0	5	5	3.4	1.3	1
		Non-DM	72	0	5.3	5.3	3.1	1	0.7
	Women	DM	16	0	4.7	4.6	2.9	0.9	1.4
		Non-DM	81	0	4.9	4.9	2.5	0.5	1.1
	Total	DM	308	0	4.8	4.8	3.1	1.1	1.2
		Non-DM	153	0	5.1	5.1	2.8	0.8	0.9
ALoss	**Men**	DM	145	1.3	3.3[a]	1.3[b]	0.3	0.1	1.4
		Non-DM	72	1.5	3.4[c]	1	0.2	0.1	1.1
	Women	DM	158	1.5	2.7	0.8	0.2	0.1	1.9
		Non-DM	78	2.2[d]	2.3	0.4	0.1	0	1.4
	Total	DM	303	1.4[e]	2.9	1[e]	0.2	0.1	1.6[e]
		Non-DM	150	1.9	2.8	0.7	0.1	0	1.3

[a]DM males vs females , Bonferroni multiple comparison, P<0.0001

[b]DM vs non-DM males; DM males vs females , Bonferroni multiple comparison, P<0.0001

[c]non-DM males vs females , Bonferroni multiple comparison, P<0.0001

[d]DM vs non-DM females; non-DM males vs females , Bonferroni multiple comparison, P<0.0001

[e]DM vs non-DM groups, ANOVA, P<0.05

Linear multiple regression analysis showed:

- Considerable attachment loss in
  - DM subjects associated with smoking habit but negatively correlated with age ($P<0.0001$)
  - Control subjects was associated with number of missing teeth, years after last dental visit, smoking habit, lower income and negatively correlated with age ($P<0.0001$)

- Tooth loss
  - in DM subjects, tooth loss was associated with age, denture wearing, considerable attachment loss and negatively correlated with self reported daily brushing frequency ($P<0.000$)
  - in Control subjects, tooth loss was associated with age, denture wearing, and considerable attachment loss and negatively correlated with years after last dental visit ($P<0.001$)

Summary

- Hong Kong Chinese middle age to elderly Type 2 diabetic patients seemed to have less caries experience in terms of decayed-filled teeth but more missing teeth (probably in relation to periodontitis) than age-and sex-matched controls;
- Half of the DM subjects surveyed had deep periodontal pockets whereas in around slightly more than 1/3 of the age-, sex-matched controls such condition was found
- DM subjects had more mean number of sextants with moderate to advanced attachment loss

Conclusion

- Both test (DM) and control groups of the middle age and elderly Chinese people surveyed had poor oral health
- DM patients seemed to suffer from more severe periodontal disease and its consequences

- Periodontal care, oral hygiene education and smoking cessation should be directed to this group of low income middle age to elderly Chinese type 2 DM subjects especially the younger members to prevent and attenuate the oral diabetic complication

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