

Assessment of Salivary Parameters and Incidence of Dental Caries in Hypertensive Patient

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Abstract

Background:

Hypertension is one of the serious systemic diseases that may cause general systemic changes, which is often reflected in the oral cavity. It has conflicting results in salivary changes among patient with hypertension; an increase, decrease or no alteration in salivary pH, flow rate can be identified.

Aim:

The purpose of the present study was to examine the association of hypertension with salivary flow rate and pH level. Hence this study was to investigate caries severity and salivary parameters viz. level of pH, flow rate in stimulated saliva in hypertensive patients and to compare results with healthy individuals.

Reason:

Hypertension is one of the serious systemic diseases affecting all populations in the world. Hence this study investigate salivary changes in hypertensive patient.

Conclusion:

Hence in this study the salivary flow rate is increased in hypertensive patient between the age groups 60-70. Decay is increased between the age group 50-60. Erosion and attrition is decreased in all age groups. The overall range of pH is 5-7, pocket depth is 2-4mm, systolic and diastolic are same 120/80.

INTRODUCTION:

Saliva plays a significant role in the maintenance of oral health. It is the complex mixture of fluids that surrounds the oral tissues, and it originates from major and minor salivary glands. Saliva consistency can be watery, thick, sticky or frothy depending on its composition(1). These components enhance taste, speech, and swallowing and facilitate irrigation, lubrication, and protection of the mucous membranes in the upper digestive tract. Salivary flow rate ranges from 0.25 to 0.35 milliliter per minute(2). Hypertension, is a chronic medical condition in which the blood pressure in the arteries is elevated. Hypertension may be diagnosed by a health professional who measures blood pressure with a device called a sphygmomanometer - the device with the arm cuff, dial, pump, and valve. Blood pressure is expressed by two measurements, the systolic and diastolic pressures, which are the maximum and minimum pressures, respectively, in the arterial system. Normal blood pressure at rest is within the range of 100-140 mmHg systolic and 60-90 mmHg diastolic(3). High blood pressure may be treated medically, by changing lifestyle factors, or a combination of the two. Important lifestyle changes include losing weight, quitting smoking, eating a healthful diet, reducing sodium intake, exercising regularly, and limiting alcohol consumption. Buffering capacity and pH are particularly important functions of saliva. The PH level varies for different hypertensive patient according to their age group(2). PH may not be as important a measure for buffering action on caries as the pH of plaque, which modifies the saliva. The buffering capacity of saliva affects plaque pH, unless the pH

of plaque is too low for enzymatic action of bacteria. The lowest level of pH plaque might be 6.1 or even lower, approximately 15 minutes after food consumption. The purpose of the present study was to examine the association of hypertension with salivary flow rate and pH level(4).

MATERIALS AND METHODS:

Method:

A total of 25 hypertensive patients of these female 13 and male 12 with different age groups were taken a survey. In that 25 subjects 4 were between 30-40, 6 were between 40-50, 8 were between 50-60, 3 were between 60-70, 3 were between 70-80. The proforma containing relevant information regarding oral problems was questioned by the researcher to different patients according to their age groups and it is filled by the researcher. It was conducted in Saveetha Dental College and Hospitals on 21/04/2015. The patient was asked the questions like whether he/she has attrition, erosion, decay etc.

Materials:

BP was checked to the patient with automatic sphygmomanometer and the systolic, diastolic and pulse rate was noted. Then the subject was asked to spit his/her saliva after 1min of interval, it was collected using eppendorf tubes which is indicating mm. The saliva secreted after 1min of interval was noted down. The salivary pH rate of the subjects was measured using pH strips, indication of the specific colours represents the pH rate of the patient.

Decay

DECAY		AGE GROUP					Total
		30-40	40-50	50-60	60-70	70-80	
a	N	3	4	1	2	3	13
	%	75.0%	66.7%	11.1%	66.7%	100.0%	52.0%
p	N	1	2	8	1	0	12
	%	25.0%	33.3%	88.9%	33.3%	.0%	48.0%
Total	N	4	6	9	3	3	25
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Erosion

EROSION		AGE GROUP					Total
		30-40	40-50	50-60	60-70	70-80	
a	N	3	3	6	2	3	17
	%	75.0%	50.0%	66.7%	66.7%	100.0%	68.0%
p	N	1	3	3	1	0	8
	%	25.0%	50.0%	33.3%	33.3%	.0%	32.0%
Total	N	4	6	9	3	3	25
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Attrition:

ATTRITION		AGE GROUP					Total
		30-40	40-50	50-60	60-70	70-80	
a	N	2	5	4	3	3	17
	%	50.0%	83.3%	44.4%	100.0%	100.0%	68.0%
p	N	2	1	5	0	0	8
	%	50.0%	16.7%	55.6%	.0%	.0%	32.0%
Total	N	4	6	9	3	3	25
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Gender

GENDER		AGE GROUP					Total
		30-40	40-50	50-60	60-70	70-80	
f	N	3	4	2	2	2	13
	%	75.0%	66.7%	22.2%	66.7%	66.7%	52.0%
m	N	1	2	7	1	1	12
	%	25.0%	33.3%	77.8%	33.3%	33.3%	48.0%
Total	N	4	6	9	3	3	25
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

DISCUSSION:

Salivary characteristics were associated inconsistently between 30-40, 40-50, 50-60, 60-70, 70-80 age groups. Salivary pH for those age groups were not statistically significant. It varies for different age groups. The caries, attrition, erosion are present in some patient and absent in some patient. There is also variation in salivary flow rate after 1 min of interval for each subject was observed.

Robinson Sabino-Silva et al in 2013 did a study on Increased SGLT1 expression in salivary gland ductal cells correlates with hyposalivation in diabetic and hypertensive

rats. This study highlights the water transporter role of SGLT1 in salivary glands, which, by increasing ductal water reabsorption, may explain the hyposalivation of diabetic and hypertensive subjects(5).

Monique Tremblay et al in 2012 did a cross sectional study on Association between salivary pH and metabolic syndrome in women. In this study, the salivary pH appeared as a possible correlate of MetS component expression(6)

C.R. PiccoLilian et al in 2012 did a study on Spontaneously hypertensive rat as experimental model of salivary hypofunction(7).

AGE GROUP		PH	SYSTOLIC	Diastolic	Salivary flow rate	Pocket depth
30-40	Mean	7.00	110.25	79.50	.300	2.25
	Std. Deviation	.000	16.317	10.344	.2309	.500
	Minimum	7	95	74	.1	2
	Maximum	7	132	95	.5	3
	Range	0	37	21	.4	1
	N	4	4	4	4	4
40-50	Mean	7.17	115.50	82.50	.275	2.67
	Std. Deviation	.753	19.817	16.022	.2824	.516
	Minimum	6	92	62	.1	2
	Maximum	8	148	101	.8	3
	Range	2	56	39	.7	1
	N	6	6	6	6	6
50-60	Mean	6.56	129.89	84.78	.278	2.67
	Std. Deviation	.527	18.388	13.664	.1873	.707
	Minimum	6	95	66	.1	2
	Maximum	7	158	105	.5	4
	Range	1	63	39	.4	2
	N	9	9	9	9	9
60-70	Mean	7.33	140.67	76.00	.750	3.00
	Std. Deviation	1.155	43.016	15.100	.0000	.
	Minimum	6	111	60	.8	3
	Maximum	8	190	90	.8	3
	Range	2	79	30	.0	0
	N	3	3	3	3	1
70-80	Mean	6.33	133.67	93.67	.150	
	Std. Deviation	.577	3.215	15.373	.0866	
	Minimum	6	130	76	.1	
	Maximum	7	136	104	.3	
	Range	1	6	28	.2	
	N	3	3	3	3	
Total	Mean	6.84	125.04	83.40	.322	2.60
	Std. Deviation	.688	22.152	13.829	.2521	.598
	Minimum	6	92	60	.1	2
	Maximum	8	190	105	.8	4
	Range	2	98	45	.7	2
	N	25	25	25	25	20

RESULT:

From the data recorded it was evident that majority of the hypertensive patients examined during the course of study belonged to the age group of 30-80 years. Around 48.0% of patient experience decay, 32.0% of patient experience erosion, and 32.0% attrition.

The overall mean and standard deviation for ph rate is 6.84, 0.688.

The over all mean and standard deviation for systolic pressure is 125.04, 22.152.

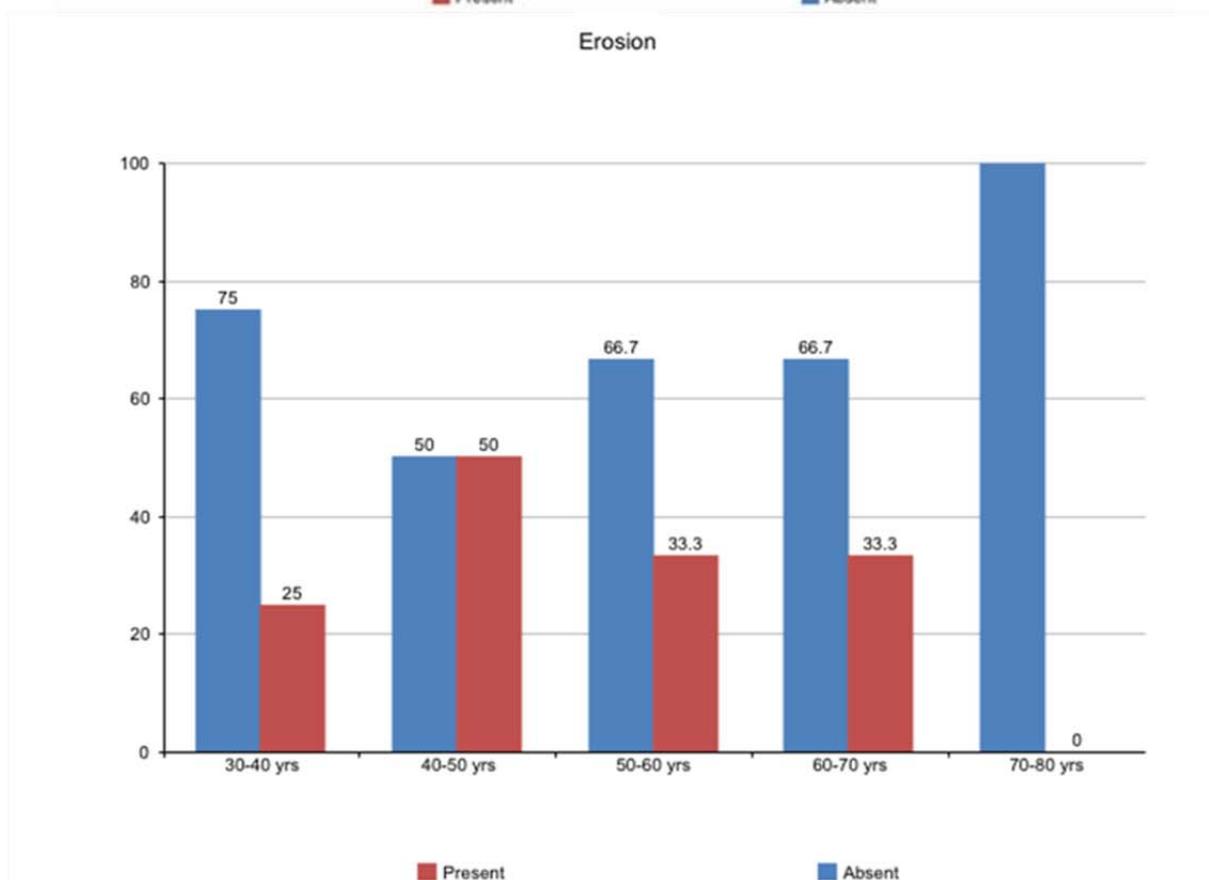
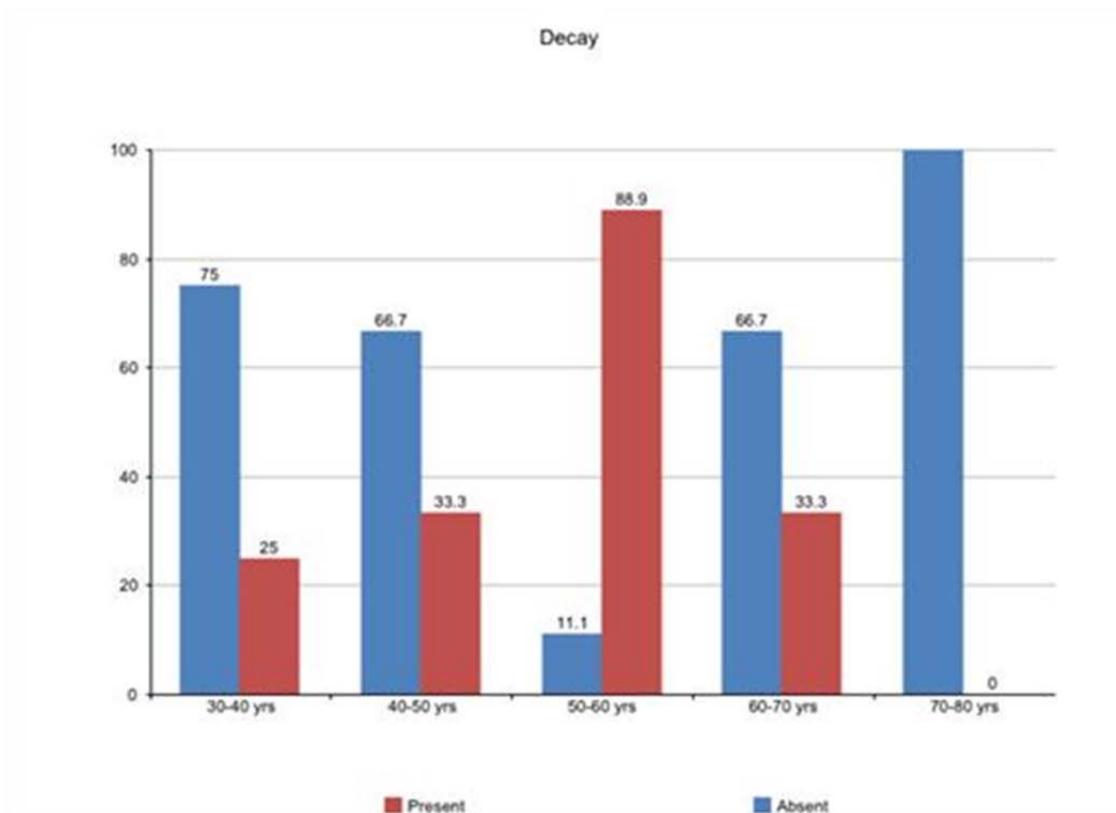
The overall mean and standard deviation for diastolic pressure is 83.40, 13.829.

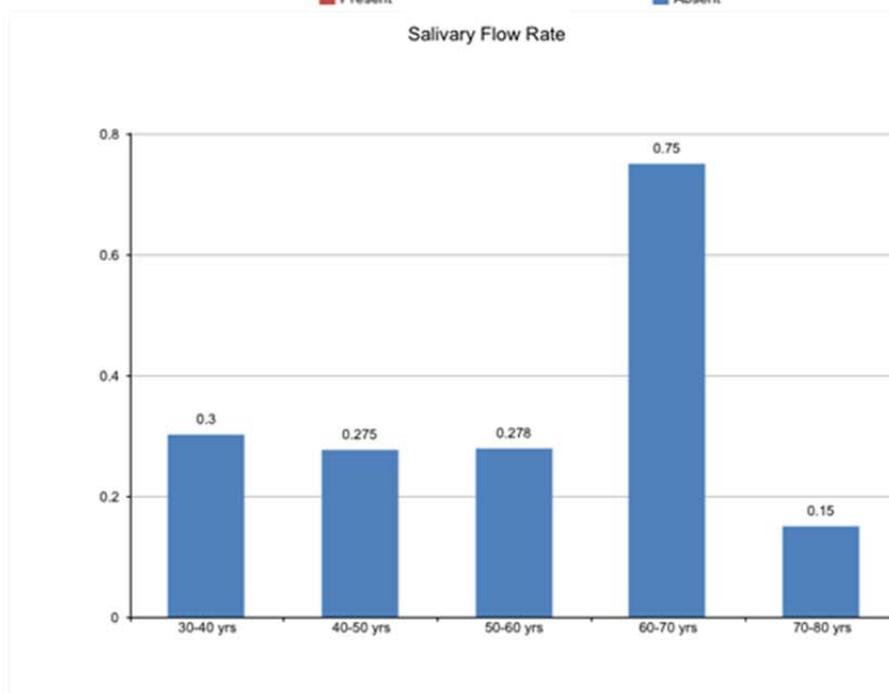
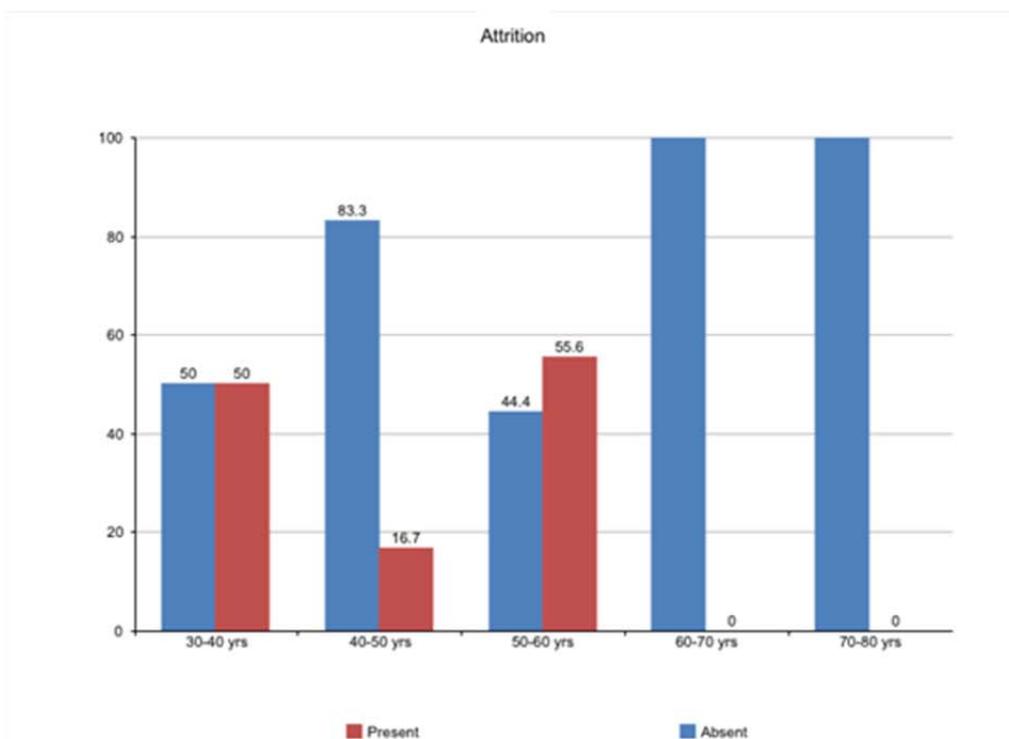
The over all mean and standard deviation for salivary flow rate is 0.322, 0.2521.

The over all mean and standard deviation for pocket depth is 2.60, 0.598

The \pm value for ph is +8, -6

The \pm value for systolic is +190, -92, Diastolic is +105, -60, salivary flow rate is +0.8, -0.1, pocket depth is +4.





CORRELATIONS

Pearson Correlation

	PH	SYSTOLIC	Diastolic	salivary flow rate	pocket depth
PH	1	.285	.064	.297	.027
SYSTOLIC	.285	1	.603(**)	.323	-.030
Diastolic	.064	.603(**)	1	-.024	-.186
salivary flow rate	.297	.323	-.024	1	.109
pocket depth	.027	-.030	-.186	.109	1

** Correlation is significant at the 0.01 level (2-tailed).

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