Results

All 40 patients, 20 males and 20 females ,between 20 to 60 years old with a mean age about 40 years ,all were represented with history of OSAS which obtained from the patients and from their partners at the time of examination.

Table (D): Shows history data taking from group A (patients with OSAS):

Variables	Male No	%	Female No	%
Snoring	20	100%	20	100%
Obstructive episodes	20	100%	20	100%
Arousals&nocturnal choking	20	100%	20	100%
Excessive daytime sleepiness	20	100%	20	100%
Intellectual deterioration&personality change	18	90%	16	80%
Abnormal motor movement	0	0%	2	10%
Morning headaches	18	90%	20	100%
Nocturnal enuresis	0	0%	0	0%
Nasal obstruction and discharge	12	60%	15	75%
Chronic cough and expectoration	13	65%	17	85%
Stridor and hoarsness of voice	3	15%	5	25%
Any neurological diseases	0	0%	0	0%
Drugs & alcohol intake	3	15%	1	5%
Cardiopulmonary symptoms	6	30%	10	50%
Thyroid symptoms	0	0%	1	5%
Social history	2	10%	0	0%

Table(D): Shows data depending on history from patients and patient's parteners ,all patients were presented with OSA and complaining of associated symptoms as snoring was found in (100% in male patients ,and 100%in female patients),obstructive episodes (100% males and 100% females), arousals & nocturnal choking (100% males and 100% females), excessive daytime sleepiness (100% males and 100% females), Intellectual deterioration & personality change (90% males and 80% females), abnormal motor movement (0% in males and 10% in females, morning headaches (90% in males and 100% in females), nasal obstruction and discharge (60% in males and 75% in females), chronic cough and expectoration (65% in males and 85% in females), stridor and hoarseness of voice(15% in males and 25% in females), drugs & alcohol intake (15% in males and 5% in females), cardiopulmonary symptoms (30% in males and 50% in females), thyroid symptoms(0% in males and 5% in females), social history (10% in males and 0% in females), all were not complaining of nocturnal enuresis or neurological diseases (0% in males and females).

Table (1): Shows basic features of male cases:

Case no.	Age	Length	Weight	BMI	Neck circumf
1	45	177	86	28	37
2	46	174	98	32	40
3	21	175	72	24	37
4	33	167	65	23	35
5	39	171	100	34.5	42
6	40	167	95	34.1	45
7	35	174	115	38.3	47
8	40	165	103	38	43
9	35	167	84	30.2	43
10	37	171	80	27.6	47
11	50	174	99	33	42
12	49	167	120	42.8	46
13	42	178	105	33.8	41
14	43	173	92	30.7	43
15	48	174	90	30	42
16	36	177	117	39	43
17	47	176	93	31	41
18	58	175	114	38	47
19	44	162	87	33.5	44
20	33	166	100	36.3	44
Mean	41	171.5	95.75	33	42.45

Table (1): Shows length in cm, weight in kgm, BMI, and neck circumference in cm in male patients with OSA. With(mean age 41y) , (mean length 171.5 cm),(mean weigh 95.75 kgm),(mean BMI 33 kg/m^2), and(mean neck circumference 42.45cm).

Table (2): Shows basic features of female cases:

Case no.	Age	Length	Weight	BMI	Neck circumf
1	40	166	87	31.6	43
2	25	100	40	40	38
3	30	167	109	39.2	44
4	48	168	115	41	44
5	51	165	68	25	36
6	38	164	96	36	40.5
7	33	165	83	30.7	42
8	32	170	71	24.5	41
9	30	155	84	35	38.5
10	40	171	80	27.6	43
11	39	170	85	29.3	44
12	27	165	68	25	37
13	26	165	69	25.5	36
14	42	173	95	33	47
15	45	150	95	41.3	40
16	70	163	52	19.6	38
17	30	166	75	27.2	40
18	29	164	116	43.3	45
19	40	163	74	27.8	46
20	37	163	111	42	42
Mean	38	161.65	83.65	32.2	41.25

Table (2): shows length in cm, weight in kgm, BMI, and neck circumference in cm in female patients with OSA. With(mean age 38y) , (mean length 161.65 cm),(mean weigh 83.65 kgm),(mean BMI 32.2 kg/m^2), and(mean neck circumference 41.25cm).

Table (3): Shows acoustic pharyngometric data of male cases:

Case no.	B amplitude (mouth)	O-P segment (oropharynx)		E amplitude (hpopharynx)
		Amplitude	Extension	
1	8	1.4	4	2.6
2	8	0.2	4	2.2
3	8	0.2	3.8	2.2
4	8	0.6	2.8	2.8
5	8	0.6	3	2.8
6	8	2	5	2.2
7	4	0.6	4.5	1
8	3.4	0.6	2.5	2.4
9	8	0.4	3.8	2.6
10	7	0.4	4.5	1.2
11	7.8	0.8	3	1.8
12	5.8	0.4	4.2	1.2
13	5.8	0.4	3.8	1.4
14	5	1.2	4	2
15	10	0.2	4	0.4
16	5.2	0.6	4	1.6
17	5.6	0.6	3.2	0.8
18	3.3	0.6	4.4	1
19	7.6	0.4	4	0.8
20	3	1	4	1.4

Table (3): Shows amplitude of mouth wave (B wave) with **{minimum 3 cm^2 and maximum 10 cm^2}**, amplitude of oropharyngeal segment (O-P segment) with **{minimum 0.2 cm^2 and maximum 1.4 cm^2}**, amplitude of hypopharyngeal wave (E wave) with **{minimum 0.4 cm^2 and maximum 2.8 cm^2}**, and extension of oropharyngeal segment with **{minimum 2.5 cm and maximum 4.5 cm }** in male patients with OSA.

Table (4): Shows acoustic pharyngometric data of female cases:

Case no.	B amplitude (mouth)	O-P segment (oropharynx)		E amplitude (hpopharynx)
		Amplitude	Extension	
1	3.8	0.4	4	1.6
2	3.6	1	4	2.4
3	3.4	0.6	2.5	2.2
4	5.6	0.4	4	0.8
5	10	0.4	4.6	0.6
6	5.6	0.4	5	0.6
7	5.8	0.4	3.5	1.4
8	4.8	0.4	4.5	1.4
9	4.6	0.4	3.5	1
10	6	0.4	4.5	1.6
11	6.2	0.4	4.2	1.8
12	8	0.4	4	0.6
13	7.8	0.4	3.5	2.2
14	7	0.4	4.5	0.6
15	8	0.2	4.1	0.6
16	3	1.4	3.9	2.4
17	7.4	0.6	4	1.4
18	7	0.2	4	0.4
19	6.8	0.8	4	1.6
20	3.6	0.4	4	1

Table(4): Shows amplitude of mouth wave (B wave) with **{minimum 3 cm^2 and maximum 10 cm^2}**, amplitude of oropharyngeal segment (O-P segment) with **{minimum 0.2 cm^2 and maximum 1.4 cm^2}**, amplitude of hypopharyngeal wave (E wave) with **{minimum 0.4 cm^2 and maximum 2.4 cm^2}** , and extension of oropharyngeal segment with **{minimum 2.5 cm and maximum 4.6 cm }** in female patients with OSA .

table (5): Shows basic features of male controls:

Case no.	Age	Length	Weight	BMI	Neck circumf
1	21	171	78	27	42
2	25	168	65	23.2	40
3	25	167	65	23.2	41
4	27	168	70	25	41.5
5	28	171	77	26.5	41.5
6	24	171	69	23.7	38
7	20	165	68	25	39
8	30	155	60	25	38.5
9	24	172	76	26	41.5
10	28	168	71	25.3	38
Mean	25	167.6	70	25	40

Table (5): Shows the basic features of the male controls, length in cm, weight in kgm, BMI in kg/m^2, and neck circumference in cm with (mean age about 25 years) ,(mean length 167.6 cm), (mean weight 70 kgm), (mean BMI 25 kg/m^2), and (mean neck circumference 40 cm).

table (6): Shows basic features of female controls:

Case no.	Age	Length	Weight	BMI	Neck circumf
1	23	166	69	25	40
2	26	170	74	25.5	41
3	29	171	75	26	38.5
4	27	173	70	23.4	38
5	25	165	70	26	41.5
6	30	165	68	25	40
7	29	166	72	26	41.5
8	30	170	78	27	40
9	22	165	69	23.7	38
10	21	167	65	23.3	39
Mean	26	168	71	25	40

Table (6): Shows the basic features of the female controls, length in cm, weight in kgm, BMI in kg/m^2, and neck circumference in cm with (mean age about 26 years), (mean length 168 cm), (mean weight 71 kgm), (mean BMI 25 kg/m^2), and (mean neck circumference 40 cm).

Table (7): Shows acoustic pharyngometric data of male controls:

Case no.	B amplitude (mouth)	O-P segment (oropharynx)		E amplitude (hpopharynx)
		Amplitude	Extension	
1	8	1.6	3	3
2	6	1	3.5	3
3	7.6	1.2	3.2	2.8
4	6.6	1.6	2	3
5	8	1.2	2.9	2.2
6	7	1.6	2.9	2.2
7	6.6	1	2.8	3.4
8	7	1.2	3	3
9	7.6	1.2	3.2	2.9
10	8	1	3	2.2

Table (7): shows amplitude of mouth wave (B wave) with **{minimum 6 cm^2 and maximum 8 cm^2}** ,amplitude of oropharyngeal segment O-P segment (C wave) with **{minimum 1 cm^2 and maximum 1.6 cm^2},** amplitude of hypopharyngeal wave (E wave) with **{minimum 2.2 cm^2 and maximum 3.4 cm^2}**, and extension of oropharyngeal segment with **{ minimum 2 cm and maximum 3.5 cm }** in male controls .

Table (8): Shows acoustic pharyngometric data of female controls:

Case no.	B amplitude (mouth)	O-P segment (oropharynx)		E amplitude (hpopharynx)
		Amplitude	Extension	
1	6.8	1.8	3	2.2
2	5.6	1.6	2.5	3
3	7.6	1.2	3.4	2.8
4	6.6	1.6	2.2	3.2
5	6.6	1	3.2	3.4
6	8	1.4	3	3
7	7.6	1.2	3.2	3
8	8	1.6	3	2.4
9	6.6	1	3.4	3.4
10	7.8	1.2	3.2	3

Table (8):Shows amplitude of mouth wave (B wave) with **{minimum 5.6 cm^2 and maximum 8 cm^2}**, amplitude of oropharyngeal segment (O-P segment) with **{minimum 1 cm^2 and maximum 1.8 cm^2}**, amplitude of hypopharyngeal wave (E wave) with **{minimum 2.2 cm^2 and maximum 3.4 cm^2}** , and extension of oropharyngeal segment with **{minimum 2.2 cm and maximum 3.4 cm }** in female controls.

Table (9): Shows Statistical comparison between group A (cases) and group B (controls) as regards basic features:

		N	Mean	Std. Deviation	T	P
Age	Cases	40	39.3250	9.44183	8.2	<0.001
	Control	20	25.7000	3.21346		
Length	Cases	40	166.5750	12.29319	0.4	>0.05
	Control	20	167.7000	3.96166		
Weight	Cases	40	89.7000	18.47826	48.5	<0.001
	Control	20	70.4500	4.81746		
BMI	Cases	40	32.5600	6.09156	7.5	<0.001
	Control	20	25.0400	1.25379		
Neck circumfere-nce	Cases	40	41.8500	3.33051	3.1	<0.05
	Control	20	39.9250	1.44436		

Table (9): Shows statistical comparison between subjects with OSAS (cases)and subjects without OSAS (controls) in mean and standard deviation of the basic features; as we see in the table there was recorded a highly significant difference in age, weight ,and BMI (P<0.001), in neck circumference there was a significant difference (P<0.05), but there was no significant difference in length(P>0.05).

Table(10): Shows Statistical comparison between male cases and male controls as regards acoustic pharyngometric data:

	gr	N	Mean	Std. Deviation	T	P
B amplitude (mouth)	cases	20	6.3150	2.35378	1.6	>0.05
	control	10	7.2400	0.70427		
Amplitude of O-P segment (oropharynx)	cases	20	0.6600	0.44533	3.9	<0.001
	control	10	1.2600	0.25033		
Extension of O-P segment (oropharynx)	cases	20	3.8250	0.62985	4.01	<0.001
	control	10	2.9500	0.38944		
E amplitude (hpopharynx)	cases	20	1.7200	0.73813	4.9	<0.001
	control	10	2.7700	0.42177		

Table (10): Shows the mean & the standard deviation (SD) of all pharyngometric waves of male (cases & controls). It shows also no significant difference in mouth wave amplitude (B wave) between male cases and male controls (P>0.05). The oropharyngeal wave amplitude and its extension O-P segment (C wave) recorded a highly significant difference between male cases and male controls (P<0.001). In hypopharyngeal wave (E wave) there was also a highly significant difference between male cases and male controls (P<0.001).

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Chart(1): Shows acoustic pharyngometric measurements in male (cases & controls).

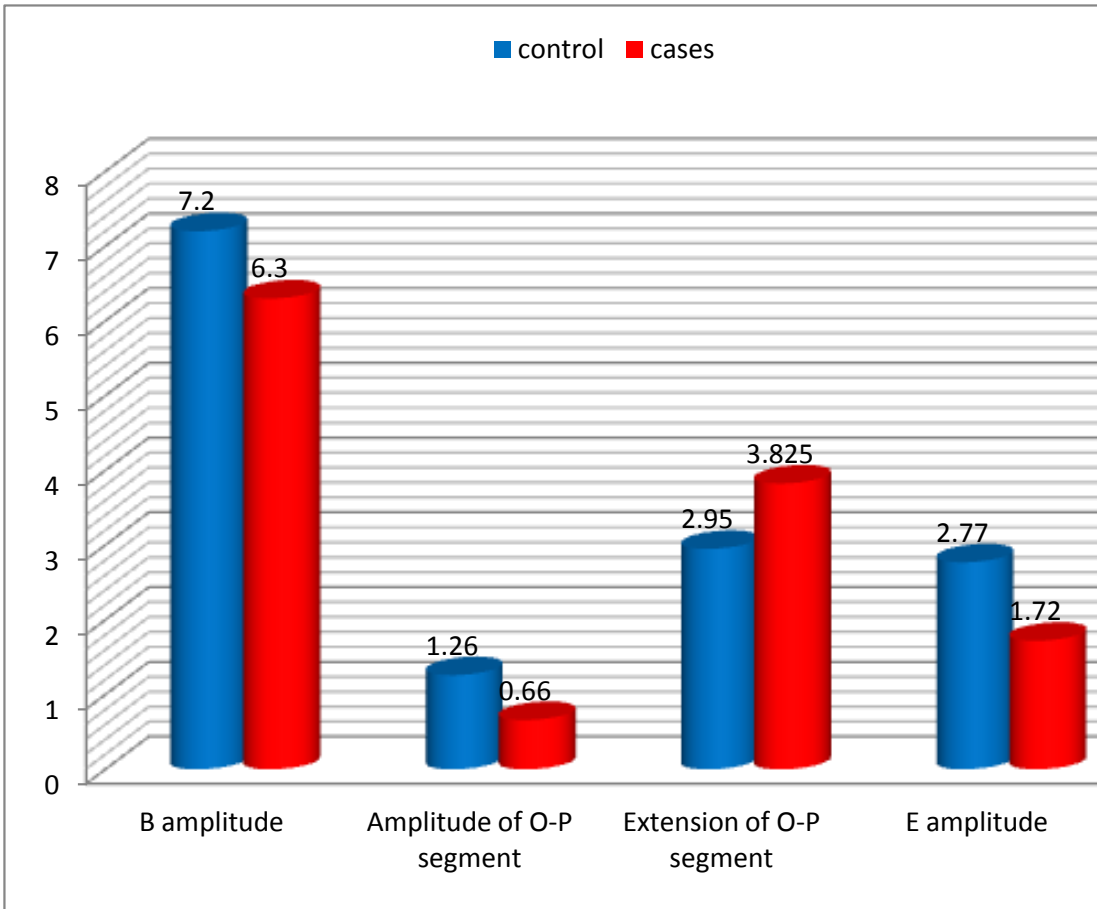


Chart (1): Shows the comparison between male cases and male controls as regards the mean amplitude of mouth wave (B wave), mean amplitude of oropharyngeal segment (O-P segment), mean amplitude of hypopharyngeal wave (E wave), and mean extension of oropharyngeal segment. This chart shows no significant difference in B wave, and a highly significant difference in C & E waves.

Table (11): Shows Statistical comparison between female cases and female controls as regards acoustic pharyngometric data:

	Gr	N	Mean	Std. Deviation	T	P
B amplitude (mouth)	Cases	20	5.9000	1.88568	2.5	<0.05
	Control	10	7.1200	0.79554		
Amplitude of O-P segment (oropharynx)	Cases	20	0.5000	0.27910	7.9	<0.001
	Control	10	1.3600	0.27968		
Extension of O-P segment (oropharynx)	Cases	20	4.0150	0.52141	5.4	<0.001
	Control	10	3.0100	0.38427		
E amplitude (hpopharynx)	Cases	20	1.3100	0.66006	8.5	<0.001
	Control	10	2.9400	0.38930		

Table (11) : Shows the mean & the standard deviation (SD) of all pharyngometric waves of female (cases & controls). It shows also a significant difference in mouth wave amplitude (B wave) between female cases and female controls (P<0.05). The oropharyngeal wave amplitude and its extension O-P segment (C wave) recorded a highly significant difference between female cases and female controls (P<0.001). In hypopharyngeal wave (E wave) there was also a highly significant difference between female cases and female controls (P<0.001).

Chart(2):Shows acoustic pharyngometric measurements in (female cases & female controls):

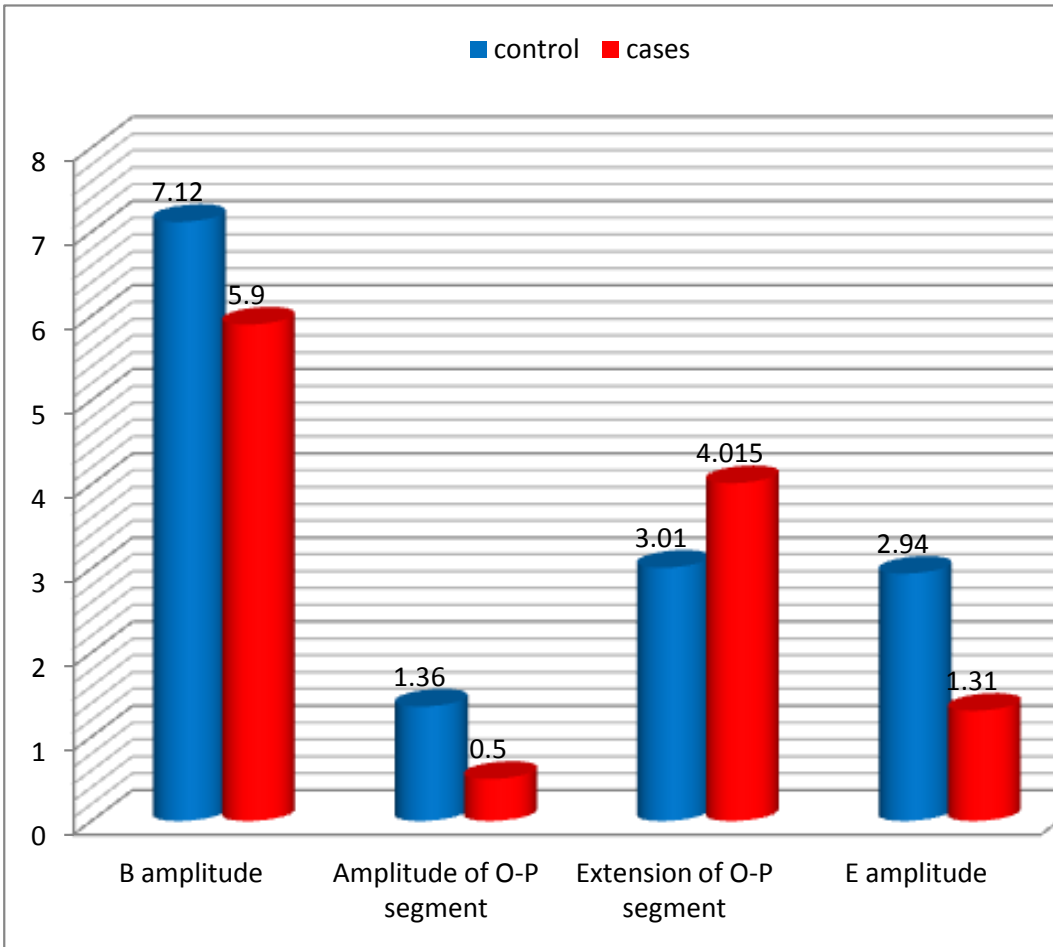


Chart (2): Shows comparison between female cases and female controls as regards the mean amplitude of mouth wave (B wave), mean amplitude of oropharyngeal segment (O-P segment), mean amplitude of hypopharyngeal wave (E wave), and mean extension of oropharyngeal segment.This chart shows a significant difference in B wave, and a highly significant difference in C & E waves.

Table (12): Shows Statistical comparison between (male cases & female cases) as regards acoustic pharyngometric data:

	Gr	N	Mean	Std. Deviation	T	P
B amplitude (mouth)	Male	20	6.3150	2.35378	0.6	>0.05
	Female	20	5.9000	1.88568		
Amplitude of O-P segment (oropharynx)	Male	20	0.6600	0.44533	1.4	>0.05
	Female	20	0.5000	0.27910		
Extension of O-P segment (oropharynx)	Male	20	3.8250	0.62985	1.03	>0.05
	Female	20	4.0150	0.52141		
E amplitude (hpopharynx)	Male	20	1.7200	0.73813	1.9	>0.05
	Female	20	1.3100	0.66006		

Table (12): Shows the mean & the standard deviation (SD) of all pharyngometric waves of cases (males & females). It shows also no significant difference in mouth wave amplitude (B wave) between male cases and female cases (P>0.05). The oropharyngeal wave amplitude and its extension O-P segment (C wave) recorded no significant difference between male cases and female cases (P>0.05). In hypopharyngeal wave (E wave) there was also no significant difference between male cases and female cases (P>0.05).

Chart(3): Shows acoustic pharyngometric measurements in (male cases & female cases).

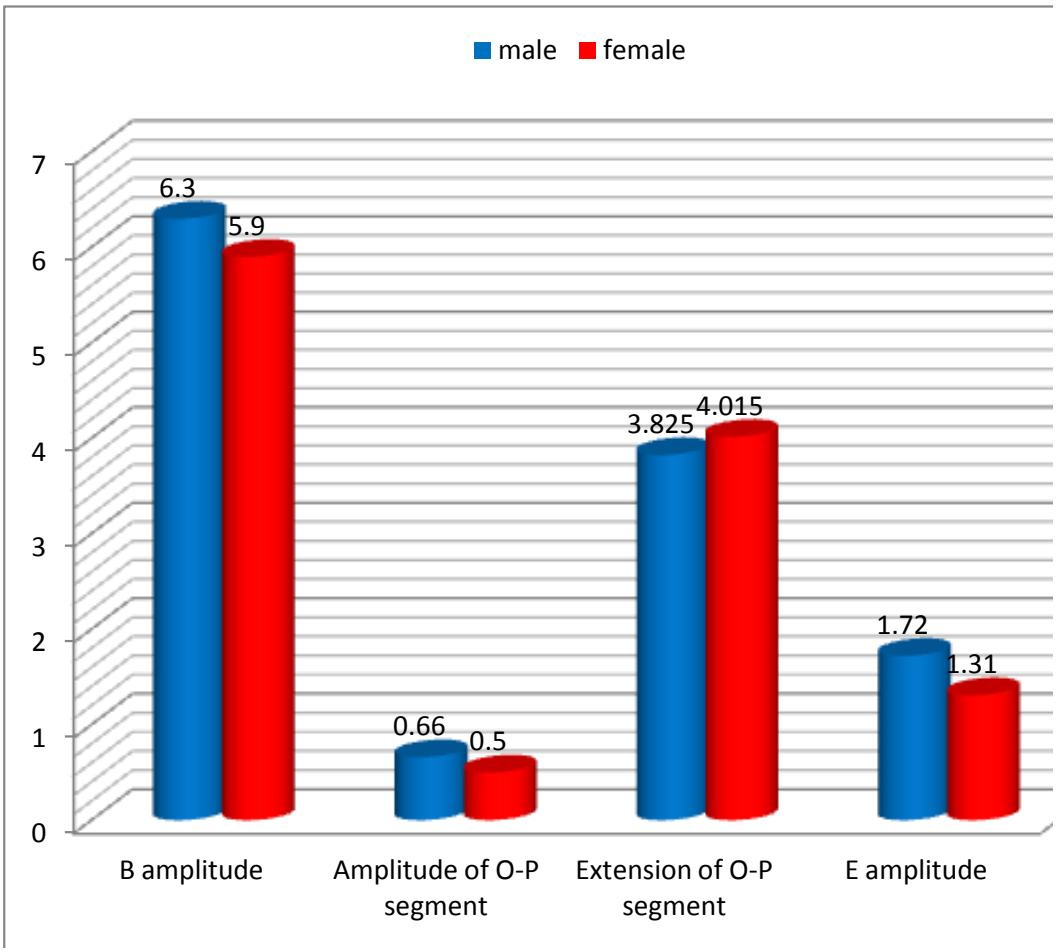


Chart (3): Shows comparison between male cases and female cases as regards the mean amplitude of mouth wave (B wave), mean amplitude of oropharyngeal segment O-P segment (C wave), mean amplitude of hypopharyngeal wave (E wave), and mean extension of oropharyngeal segment. This chart shows no significant difference in B wave, C wave & E wave.

Table (13):Shows Statistical comparison between male controls and female controls as regards acoustic pharyngometric data:

	Gr	N	Mean	Std. Deviation	T	P
B amplitude (mouth)	Male	10	7.2400	0.70427	0.4	>0.05
	Female	10	7.1200	0.79554		
Amplitude of O-P segment (oropharynx)	Male	10	1.2600	0.25033	0.8	>0.05
	Female	10	1.3600	0.27968		
Extension of O-P segment (oropharynx)	Male	10	2.9500	0.38944	0.4	>0.05
	Female	10	3.0100	0.38427		
E amplitude (hpopharynx)	Male	10	2.7700	0.42177	0.9	>0.05
	Female	10	2.9400	0.38930		

Table (13): Shows the mean & the standard deviation (SD) of all pharyngometric waves of controls (males & females). It shows also no significant difference in mouth wave amplitude (B wave) between male controls and female controls (P>0.05). The oropharyngeal wave amplitude and its extension O-P segment (C wave) recorded no significant difference between male controls and female controls (P>0.05). In hypopharyngeal wave (E wave) there was also no significant difference between male controls and female controls (P>0.05).

Chart(4): Shows acoustic pharyngometric measurements in male controls & female controls.

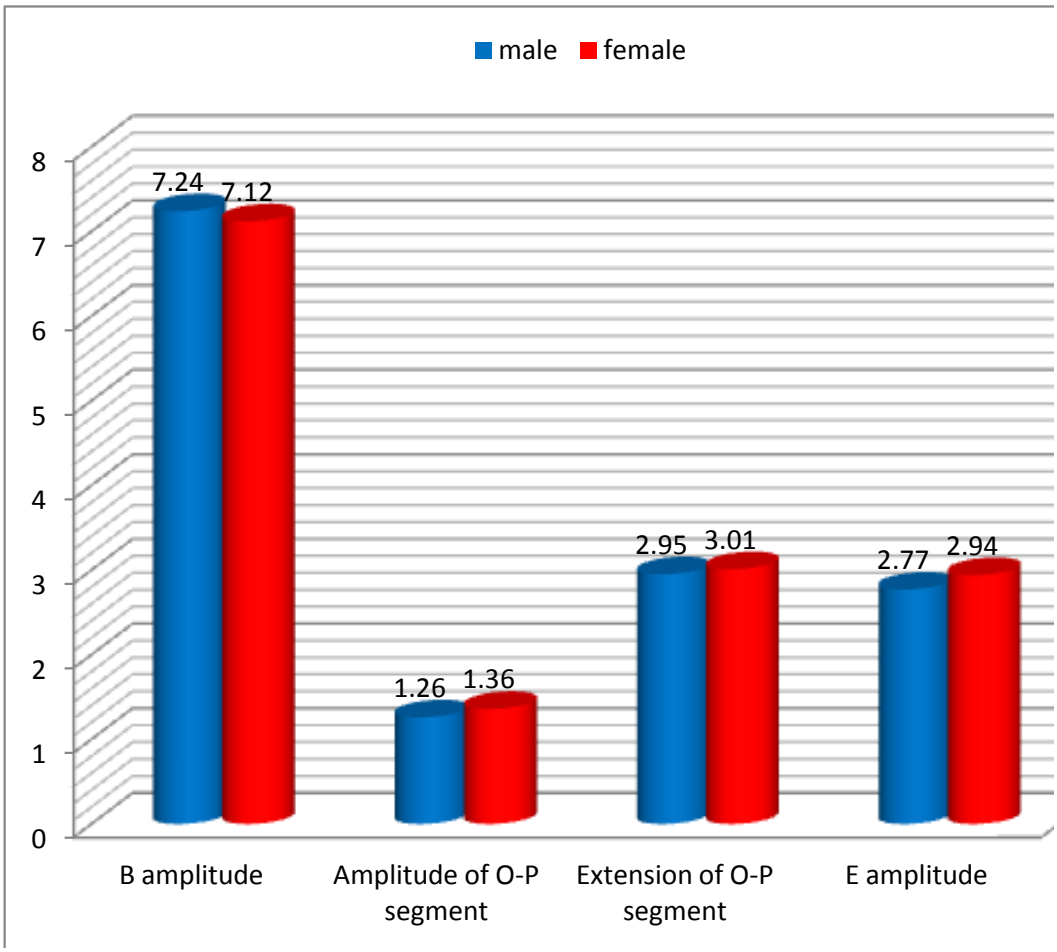
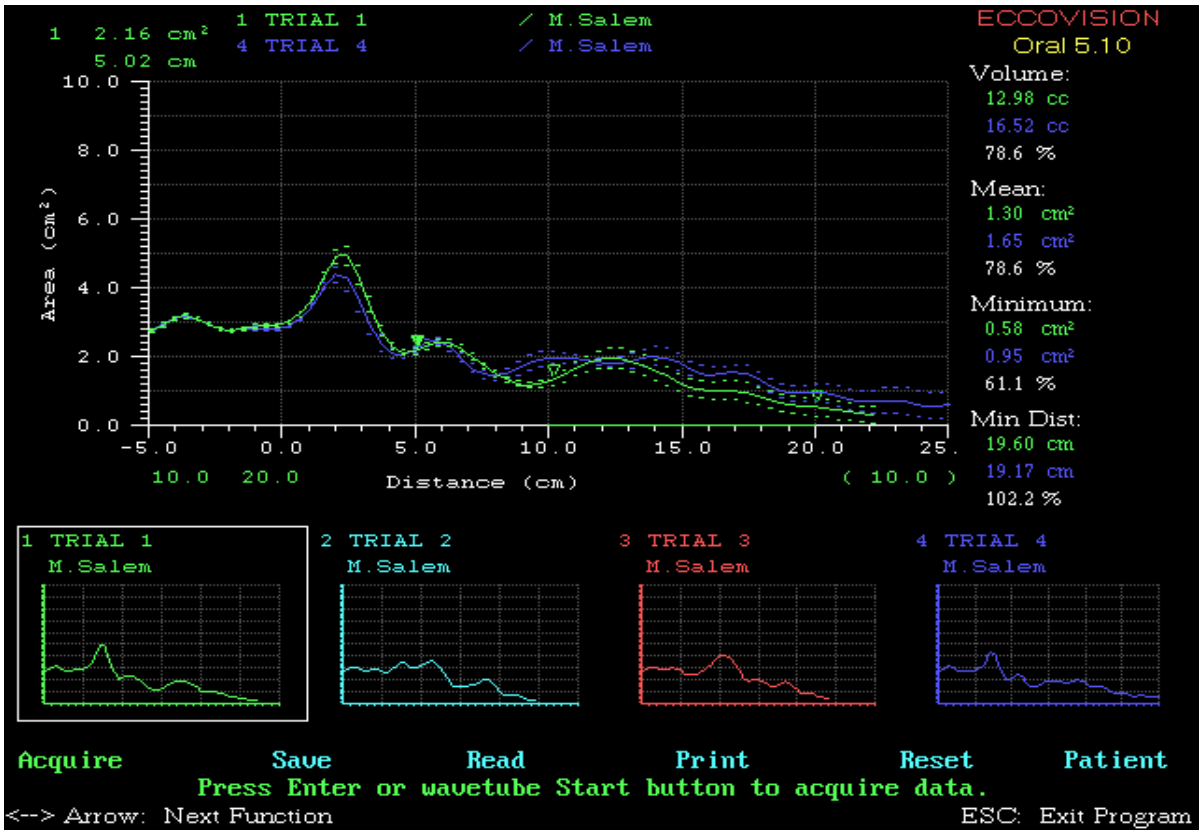


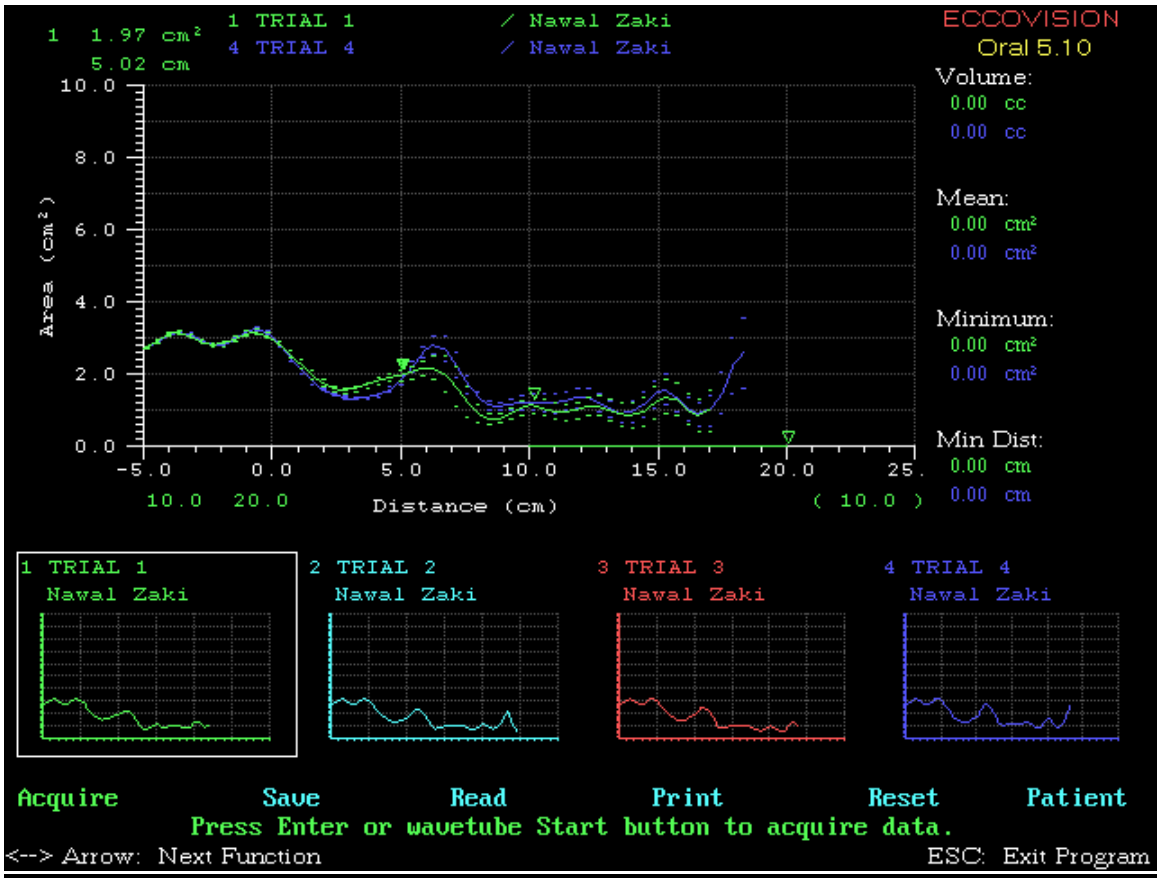
Chart (4): Shows comparison between male controls and female controls as regards the mean amplitude of mouth wave (B wave), mean amplitude of oropharyngeal segment O-P segment (C wave), mean amplitude of hypopharyngeal wave (E wave), and mean extension of oropharyngeal segment. This chart shows no significant difference in B wave, C wave & E wave.

Examples



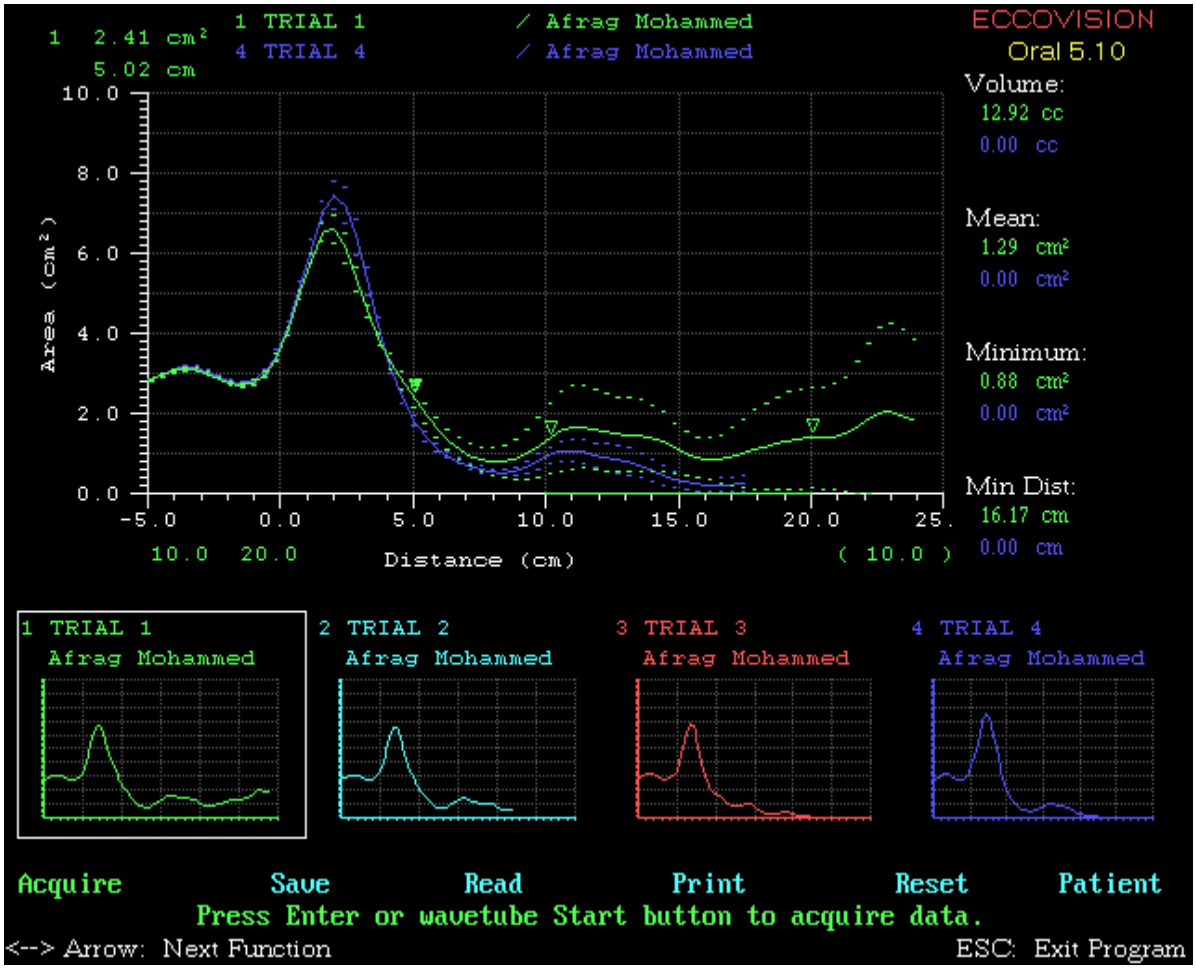
Comments:

- Clinical examination: normal person.
- Diagram: show normal (B,C,D,and E)waves
- Normal curve



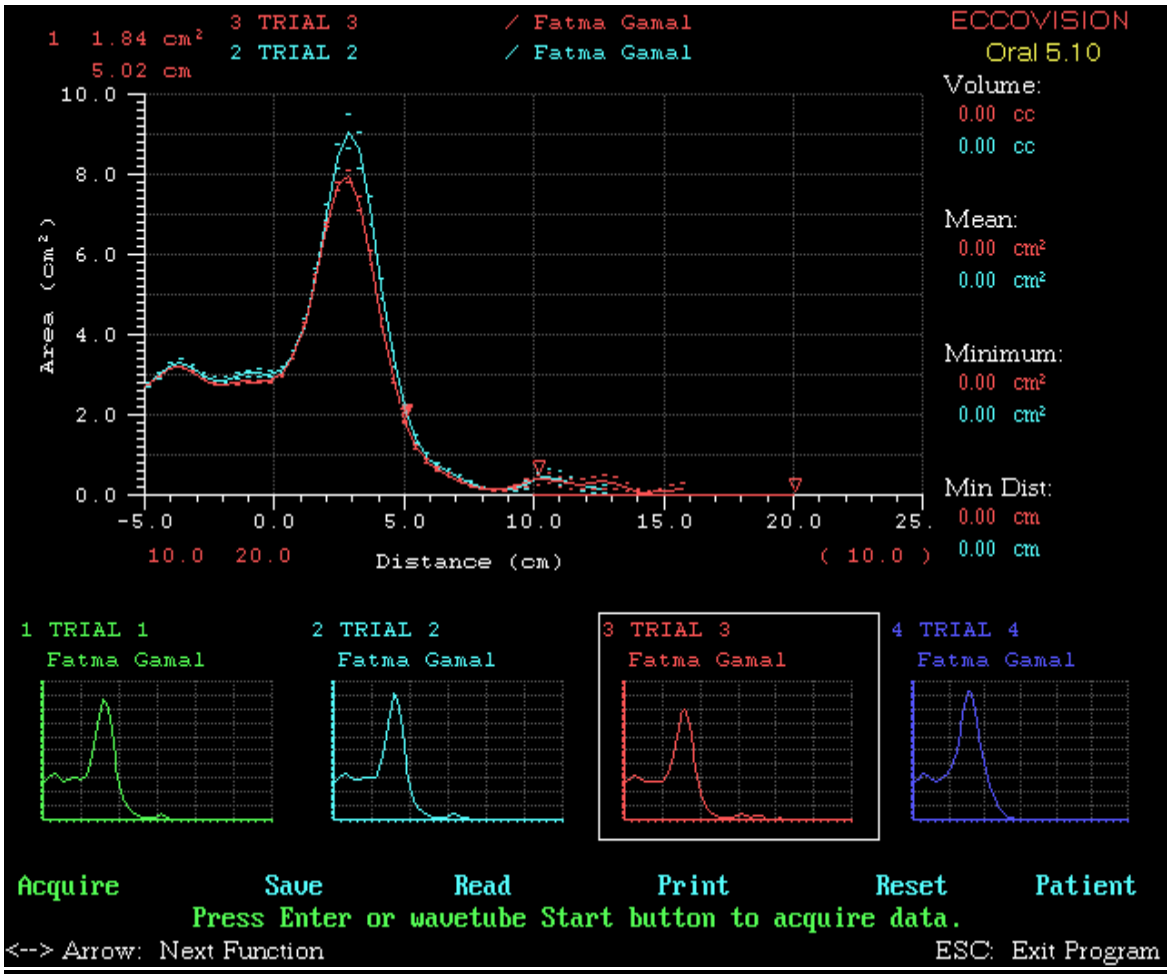
Comments:

- Clinical examination : macroglossia , hypertrophic lingual tonsile,redundent soft palate and kissing palatin tonsile.
- Diagram: show marked depressed (B) oral wave and depressed , elongated O-P segment (C) wave



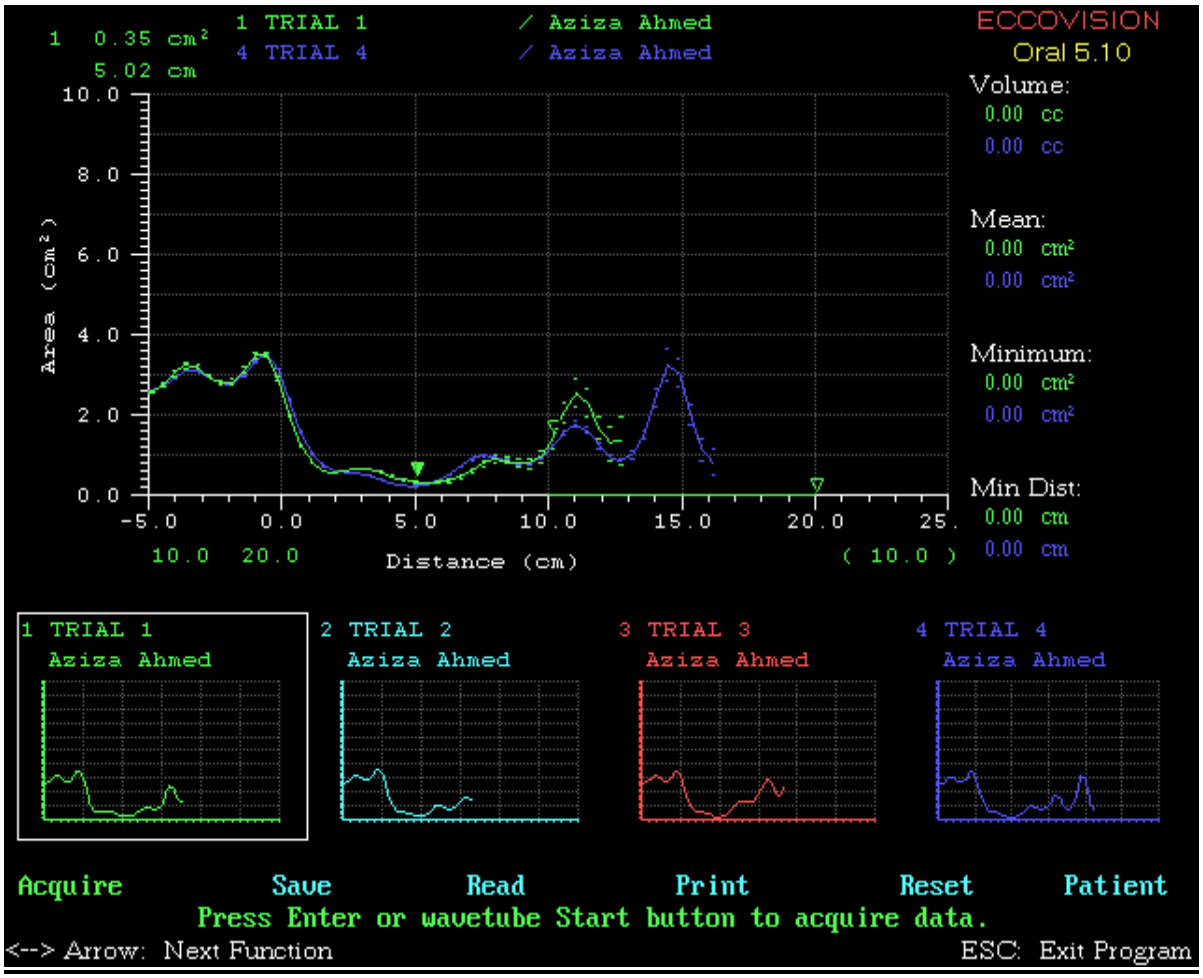
Comments:

- Clinical examination: redundent soft palate with kissing tonsile
- Diagram: show normal (B) wave and depressed , elongated O-P segment (C)wave represented oropharyngeal wave with normal (E) wave hypopharyngeal wave



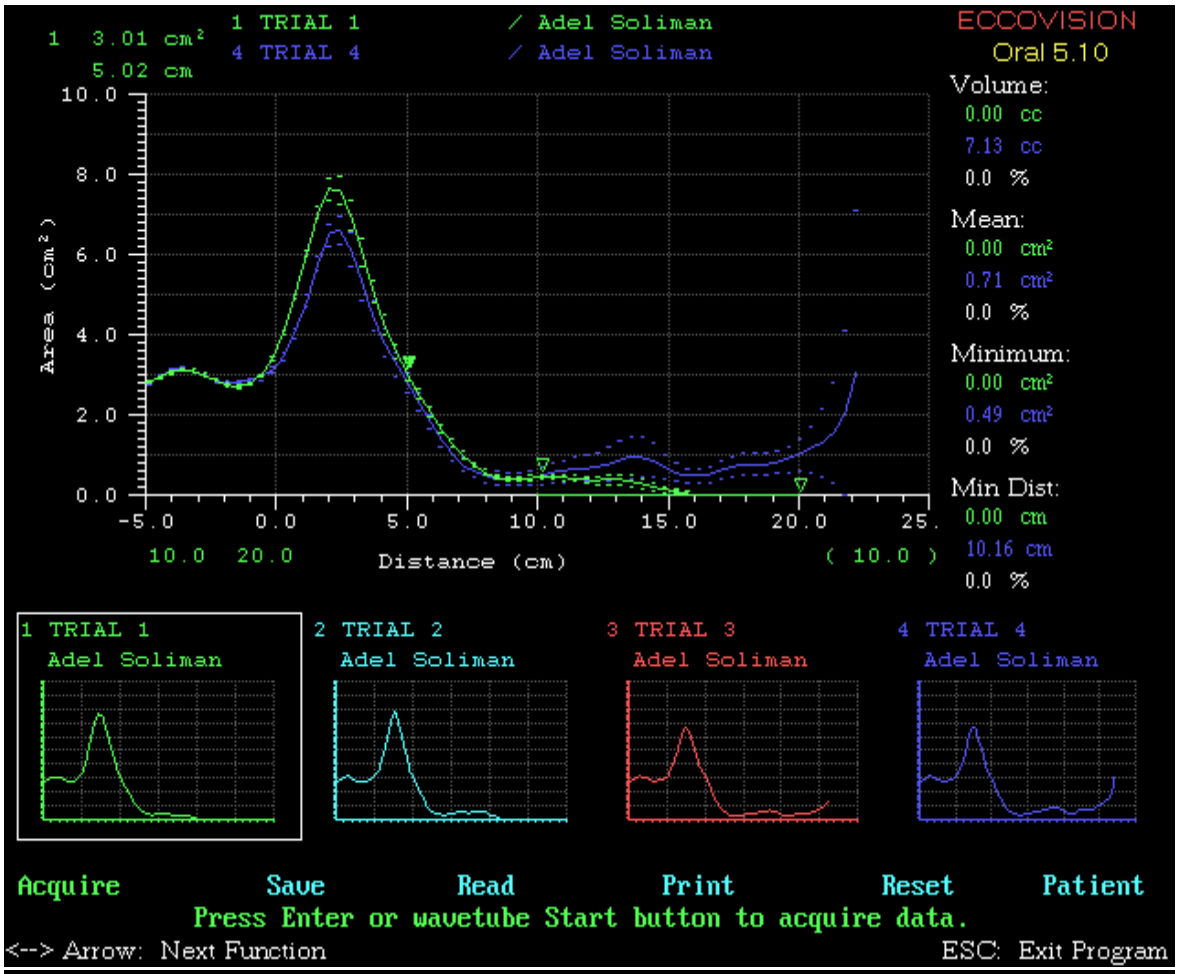
Comments:

- Clinical examination: hypertrophic elongated uvula and redundant soft palate.
- Diagram: show normal (B) wave, marked depressed , elongated O-P segment (C) wave and depressed (E) wave hypopharyngeal wave.



Comments:

- Clinical examination: macroglossia ,kissing tonsile,and redundent soft palate.
- Diagram: show depressed (B) wave , marked depressed , elongated O-P segment (C)wave normal (E)wave.



Comments:

- Clincal examination: redundent soft palate and elongated uvula.
- Diagram: show normal (B)wave ,depressed , elongated O-P segment (C) wave and normal (E)wave.