RESULTS

One hundred and five healthy males were divided according to age into seven groups (group 1 to group 7), in addition to fifteen boys complaining of CDGP will be studied in the last group (group 8). All groups included equal number of males (n= 15). These groups were studied and showed no significant difference as regards natural distribution of age in each group (table 1).

Table (1): Comparison between all study groups as regards natural distribution of age.

Group	Mean ± standard deviation "SD"	Z test	Significance
1	**7.2±2.68**	**2.05**	**Non significant**
2	**13.9±3.7**	**-1.58**	
3	**25.8±5.0**	**0.21**	
4	**35.1±5.9**	**-0.26**	
5	**44.9±6.7**	**-0.34**	
6	**54.6±7.3**	**-0.46**	
7	**65.1±8.0**	**-0.19**	
8	**15.4±3.9**	**-0.58**	

AMH level was estimated in different study groups. AMH levels were higher in group 1 when compared to group 2 (table 2). According to the signs of puberty and the level of AMH, the healthy boys in group 2 were divided into two subgroups. The healthy boys before age of normal puberty were in subgroup (group 2a) while those showed signs of normal puberty were in subgroup (group 2b). The level of AMH was elevated AMH was elevated in (group 1) and in subgroup (group 2a) compared to subgroup (group 2b) (table 3 & 4).

Table (2): comparison between group (1) and group (2) as regards AMH levels.

AMH level (ng/ml)	Group 1 n=15	Group 2 n=15	T	P	Significance
Mean±SD	25.44±5.04	17.90±4.20	4.52	<0.001	Highly significant

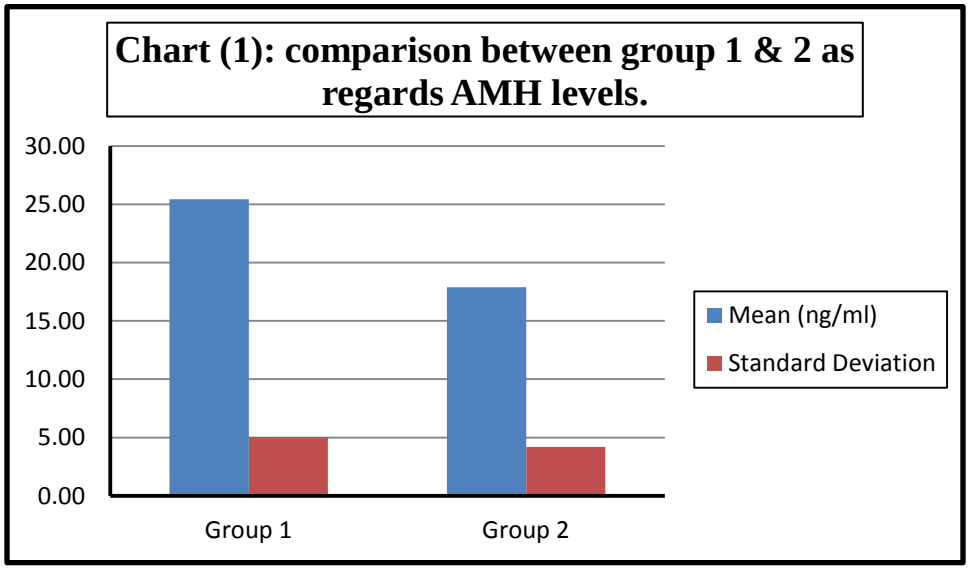


Table (3): comparison between group (1) and (2a) as regards AMH levels.

AMH level (ng/ml)	Group 1 n=15	Group 2 (a) n=7	T	P	Significance
Mean±SD	25.44±5.04	24.20±4.90	0.54	> 0.05	Non-significant

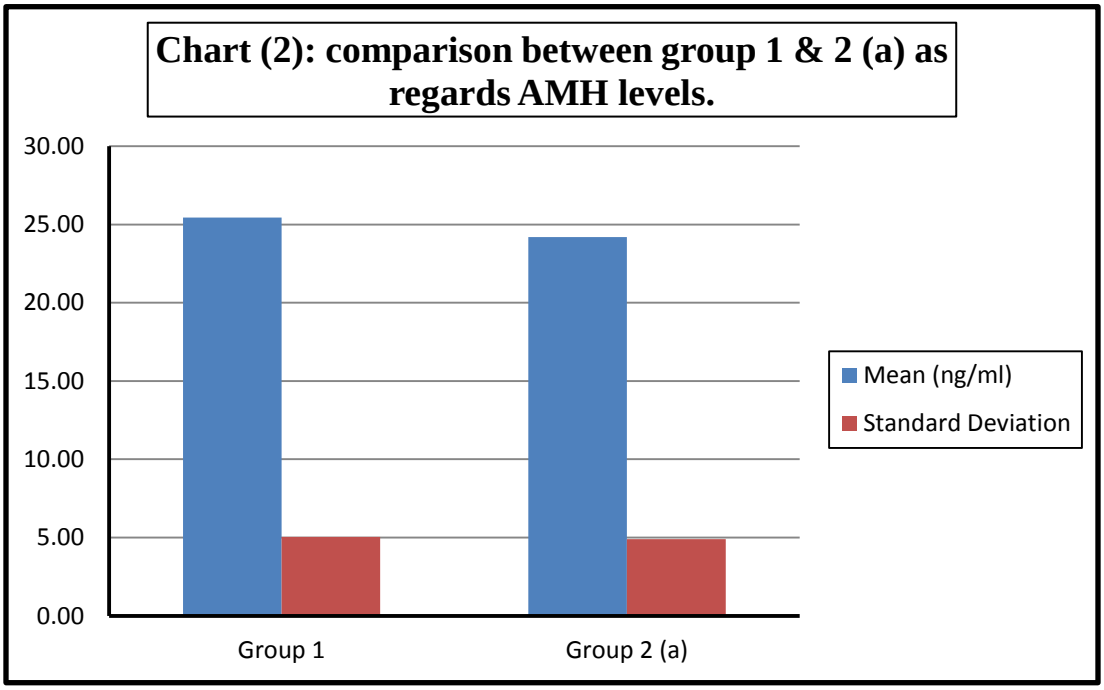
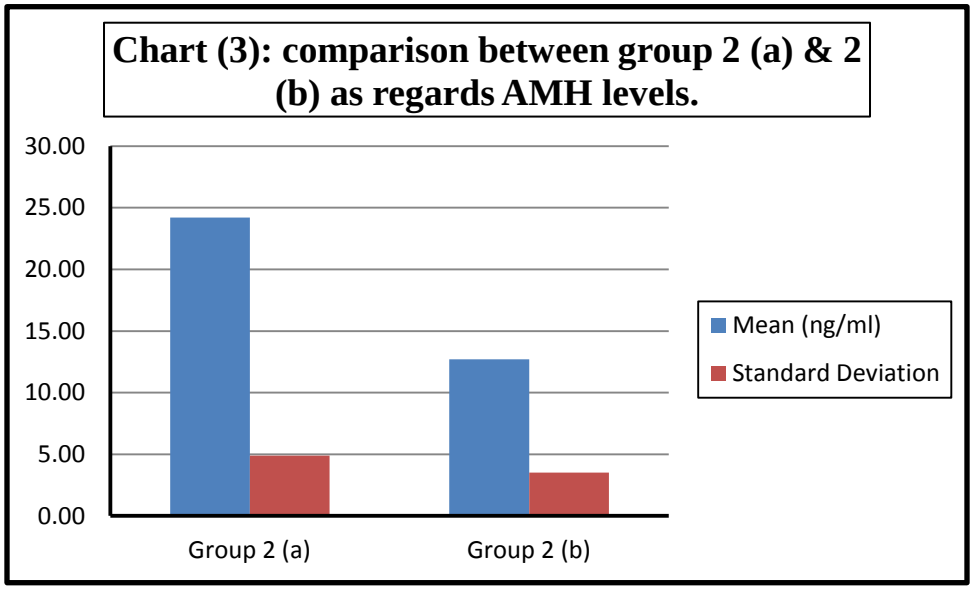


Table (4): comparison between group 2 (a) and group 2 (b) as regards AMH levels.

AMH level (ng/ml)	Group 2 (a) n=7	Group 2 (b) n=8	T	P	Significance
Mean±SD	24.20±4.90	12.70±3.50	5.28	<0.001	Highly significant



AMH levels in group (1) were higher than those in group (3) (table 5). AMH levels showed gradual decrease by advancing age. The AMH level in group (4) and group (5) were compared and showed no significant difference (table 6). There was significant difference between group (6) and group (7) as regards AMH level (table 7).

Table (5): comparison between group (1) and group (3) as regards AMH levels.

AMH level (ng/ml)	Group 1 n=15	Group 3 n=15	T	P	Significance
Mean±SD	25.44±5.04	9.70±3.10	10.30	<0.001	Highly significant

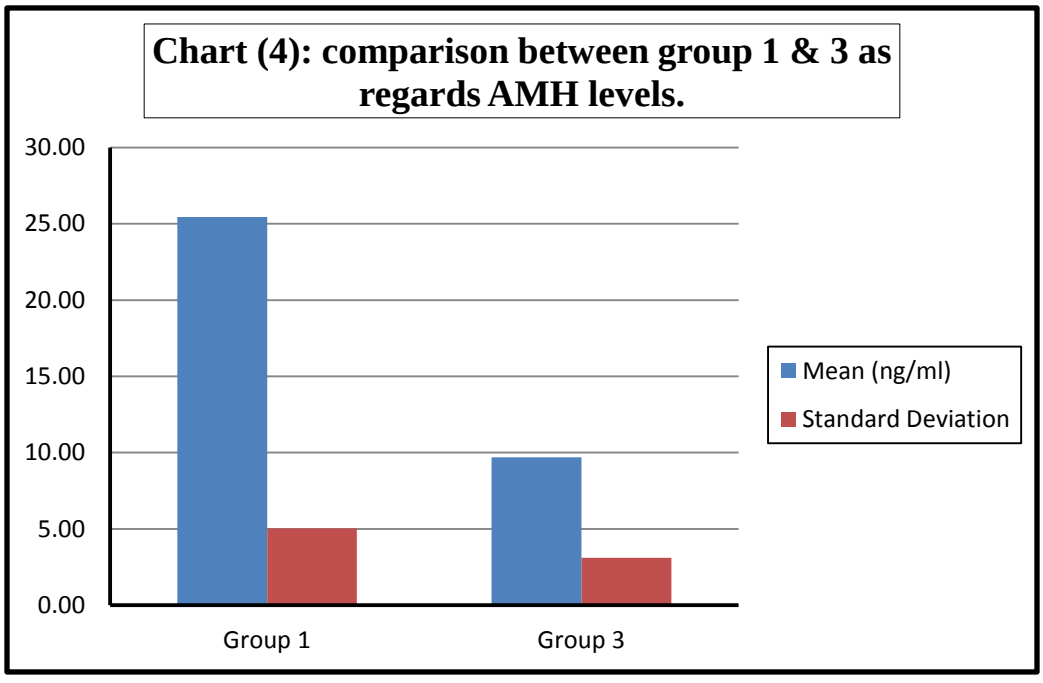


Table (6): comparison between group (4) and group (5) as regards AMH levels.

AMH level (ng/ml)	Group 4 n=15	Group 5 n=15	T	P	Significance
Mean±SD	9.20±3.00	8.10±2.80	1.03	> 0.05	Non-significant

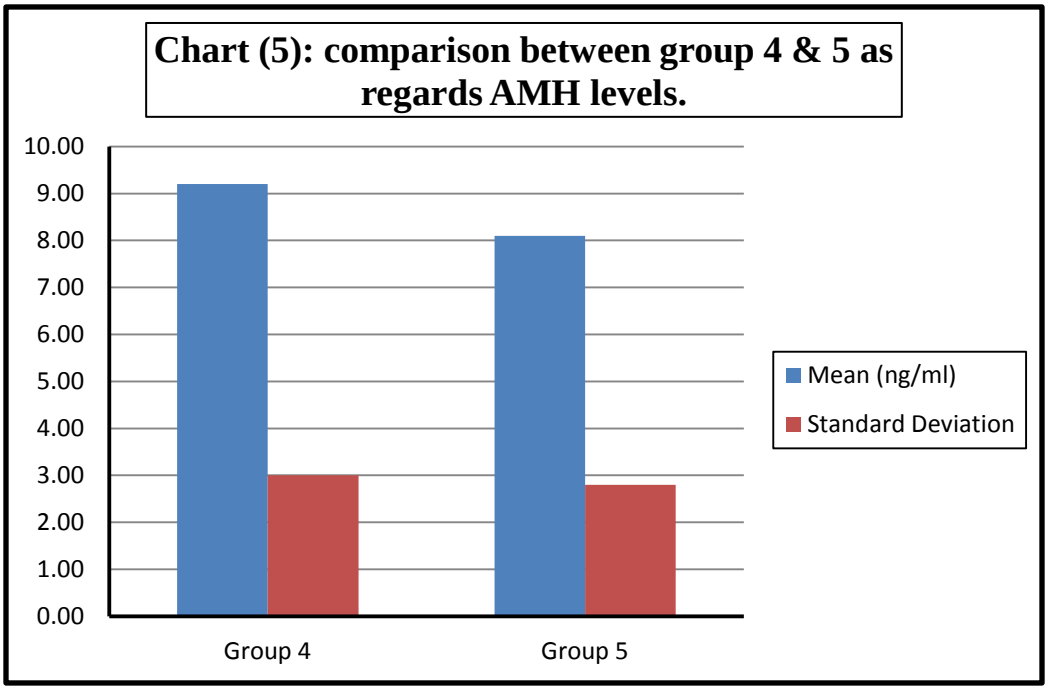


Table (7): comparison between group (6) and group (7) as regards AMH levels.

AMH level (ng/ml)	Group 6 n=15	Group 7 n=15	T	P	Significance
Mean±SD	5.10±2.20	3.20±1.80	2.59	< 0.01	Significant

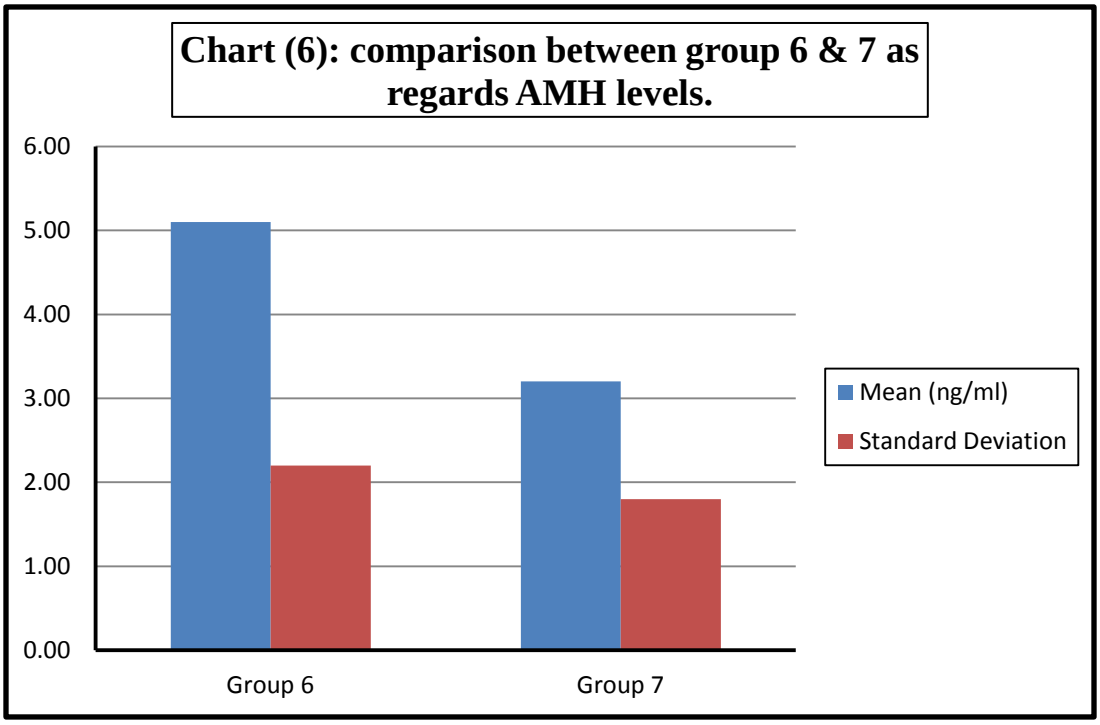


Table 8 showed highly significant difference in AMH levels in two extreme of age. AMH levels in very young boy in group (1) were (Mean ± SD: 25.44±5.04). While AMH levels in very old men in group (7) were (Mean ± SD: 3.20±1.80).

Table (8): comparison between group (1) and group (7) as regards AMH levels.

AMH level (ng/ml)	Group 1 n=15	Group 7 n=15	T	P	Significance
Mean±SD	25.44±5.04	3.20±1.80	16.00	<0.001	Highly significant

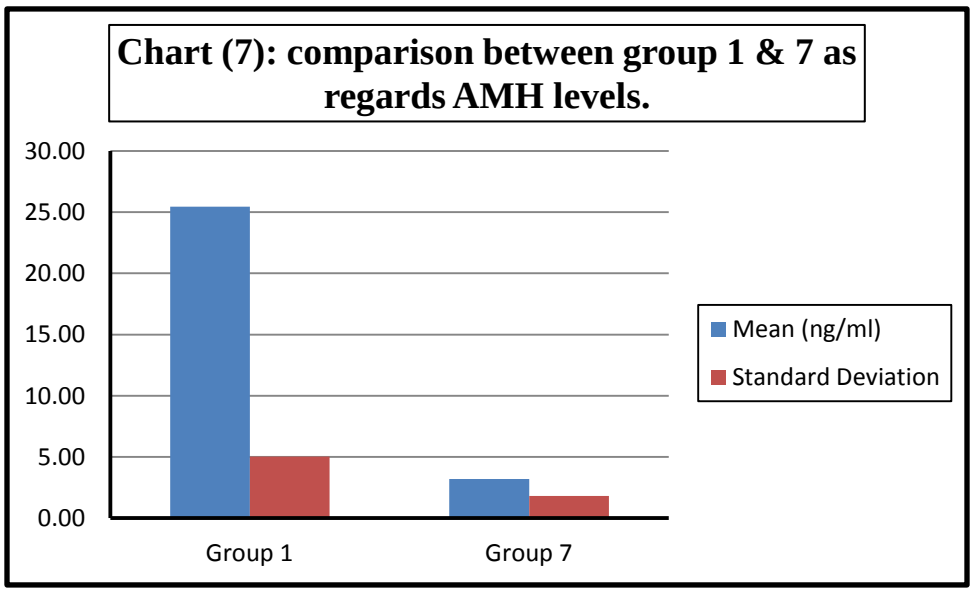


Chart 8 showed the decreasing levels of AMH by increasing age in healthy men. There were sharp decline in AMH level with onset of puberty. There were marked decline in AMH levels in old age.

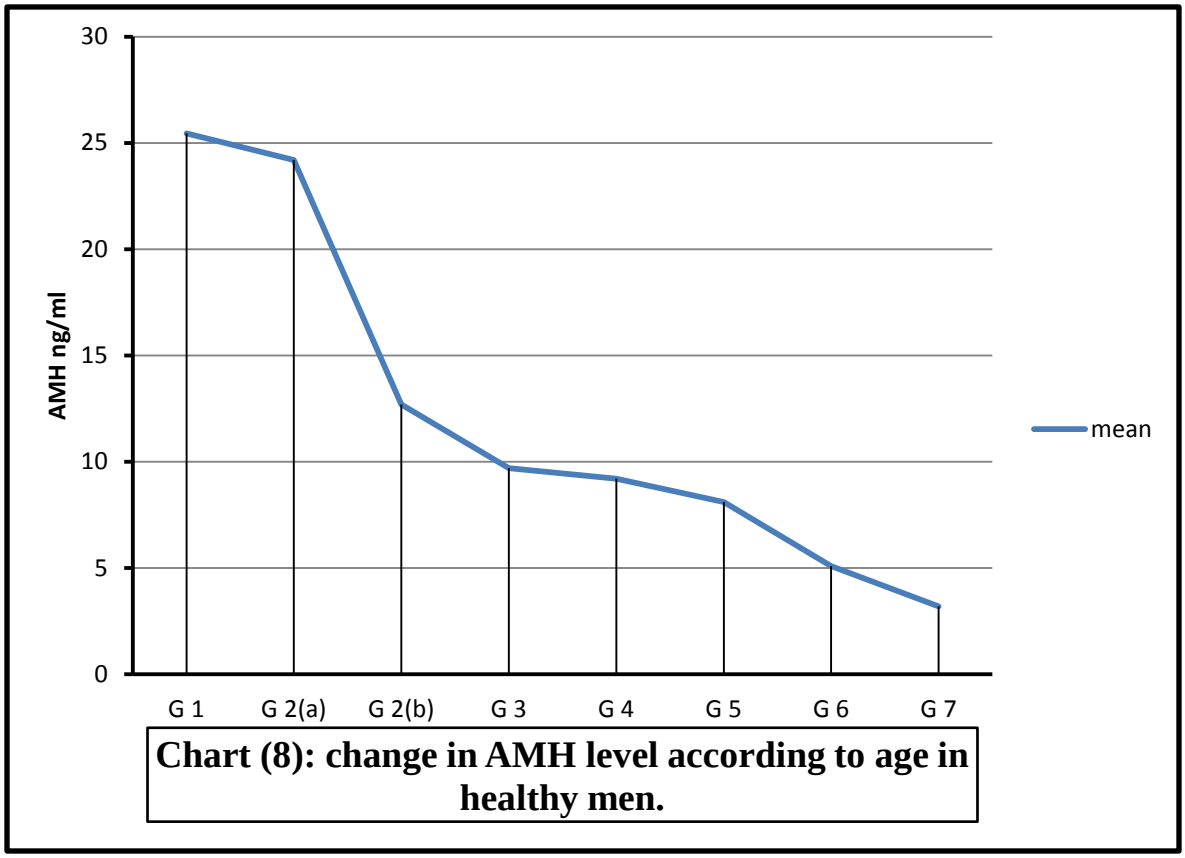


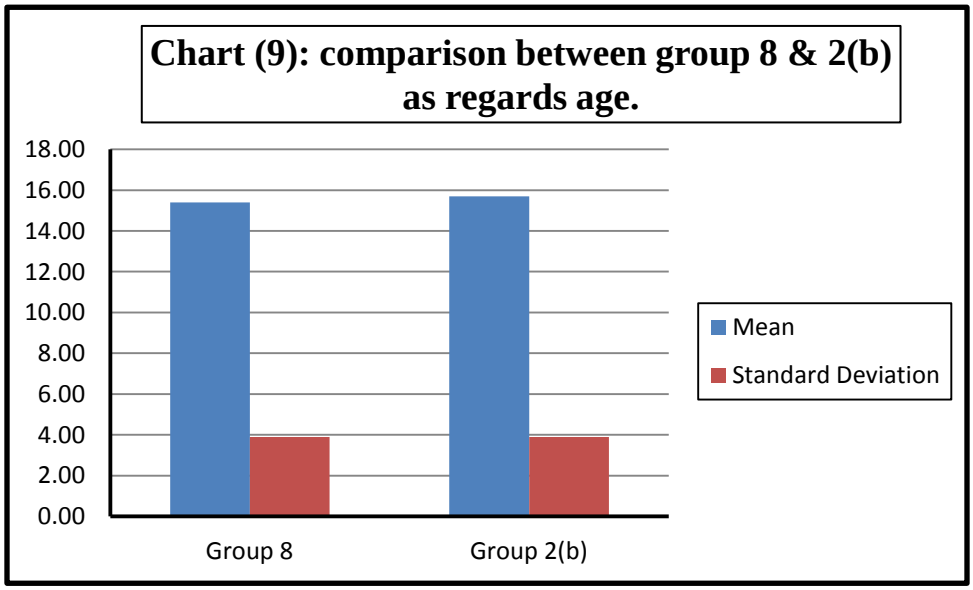
Chart (8): change in AMH level according to age in healthy men.

CDGP & AMH

The last group **(Group 8)** included fifteen boys were complained of CDGP. The age of these boys were range from fourteen years to eighteen years. This group was compared to another group of completely healthy boys group (2b). Table (9) showed comparison between patients in group (8) and healthy control in group (2b) as regards age. There was non-significant difference between two groups.

Table (9): comparison between group (8) and group (2b) as regards age.

Age	Group 8 n=15	Group 2(b) n=8	T	P	Significance
Mean±SD	15.40±3.90	15.70±3.90	0.167	> 0.05	Non-significant



All boys in this group were subjected to complete genital examination to determine the Tanner stage of puberty table (10). The majority of healthy boys were in tanner stage 4 to 5. While boys in CDGP group (8) were in early tanner stages.

Table (10): comparison of Tanner stages in the CDGP group (8) and the age matched healthy control group (2b).

	Patient n.	Patient age	Tanner stage
Healthy control group (2b)	**23**	**14**	Tanner 5
	24	**14**	Tanner 5
	25	**14**	Tanner 5
	26	**15**	Tanner 5
	27	**15**	Tanner 5
	28	**18**	Tanner 5
	29	**18**	Tanner 5
	30	**18**	Tanner 5
CDGP group (8)	**106**	**14**	Tanner 1
	107	**14**	Tanner 1
	108	**14**	Tanner 1
	109	**14.5**	Tanner 1
	110	**14.5**	Tanner 1
	111	**15**	Tanner 2
	112	**15**	Tanner 2
	113	**15**	Tanner 2
	114	**15.5**	Tanner 2
	115	**15.5**	Tanner 2
	116	**16.5**	Tanner 2
	117	**16.5**	Tanner 2
	118	**17**	Tanner 2
	119	**17**	Tanner 2
	120	**17**	Tanner 2

The gonadotropins levels were measured in the CDGP group (8) to exclude the pathological causes of delayed puberty. The gondotropins levels were measured in the age matched group of completely healthy boy group (2b). Table (11) showed the comparison between CDGP and control group as regards LH levels. LH level was in CDGP group (8) (Mean ± SD: 0.694±0.833) lower than its level in control group (2b) (Mean ± SD: 2.16±1.47).

Table (11): comparison between CDGP (8) and control group (2b) as regards LH levels.

LH level mIU/ml	Group 8 n=15	Group 2(b) n=8	T	P	Significance
Mean±SD	0.694±0.233	2.16±1.47	2.832	> 0.001	Highly significant

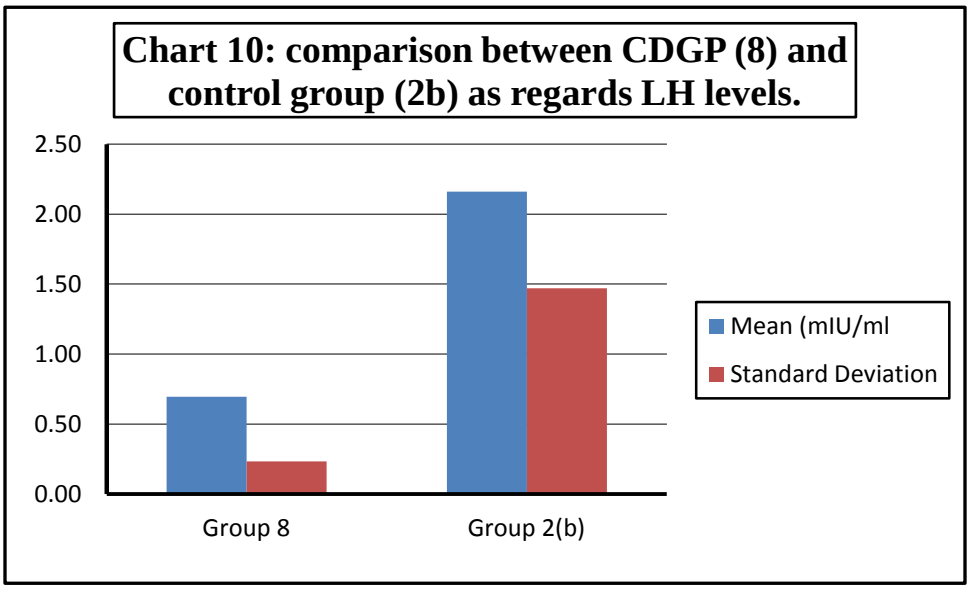
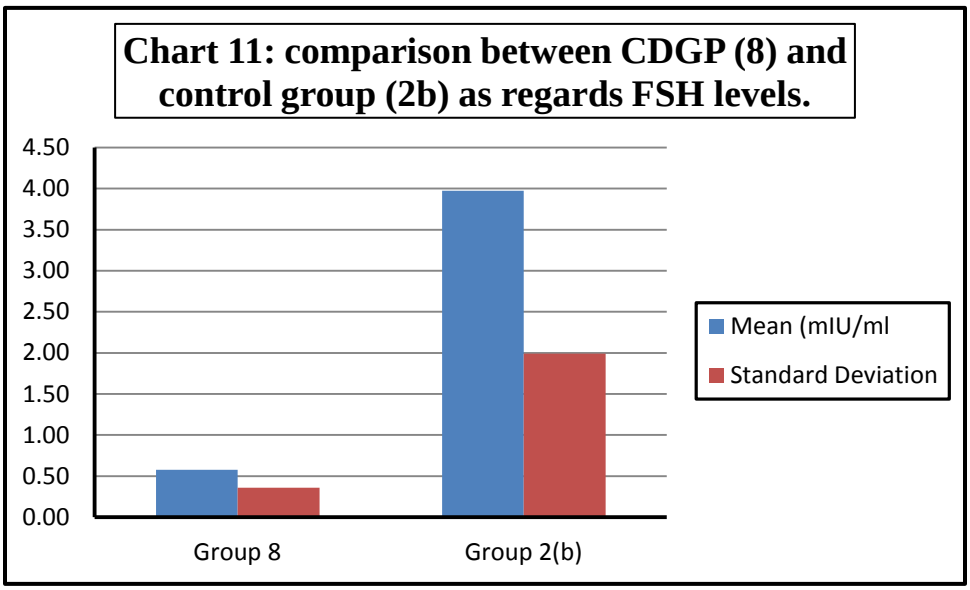


Table (12) showed the comparison between CDGP and control group as regards FSH levels. FSH level was in CDGP group (8) (Mean ± SD: 0.576±0.759) lower than its level in control group (2b) (Mean ± SD: 3.975±1.99).

Table (12): comparison between CDGP (8) and control group (2b) as regards FSH levels.

FSH level mIU/ml	Group 8 n=15	Group 2(b) n=8	T	P	Significance
Mean±SD	0.576±0.359	3.975±1.99	4.79	> 0.001	Highly significant

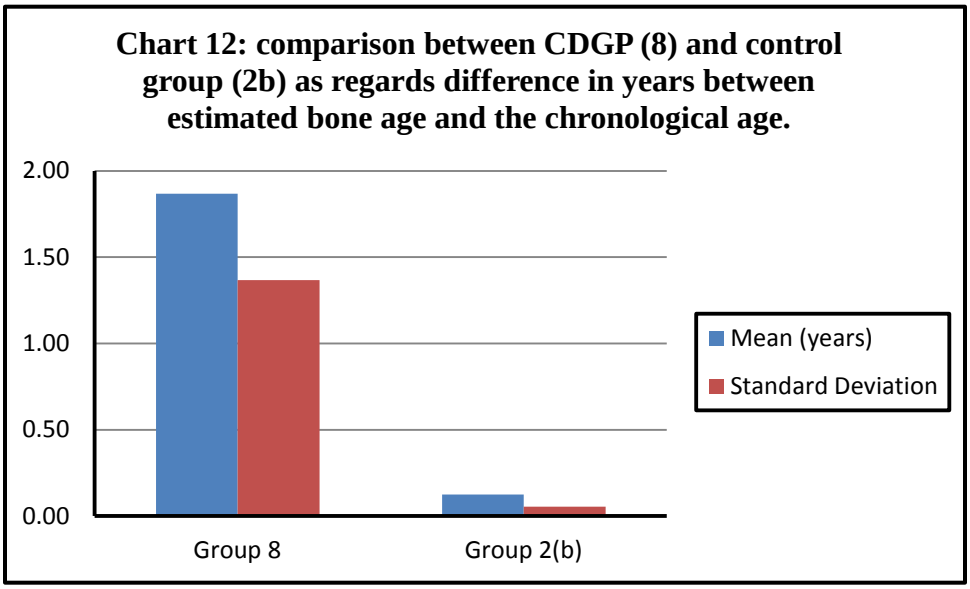


All boys in CDGP group (8) and control group (2b) were subjected to left wrist bone X ray to determine the bone age. Bone age of boys was estimated by Greulich and Pyle method. The differences between estimated bone age and the chronological age of these boys were measured. Table (13) showed

the comparison between CDGP and control group as regards difference between estimated bone age and the chronological age. The difference in years was in CDGP group (8) (Mean ± SD: 1.867±1.366). The difference in years was in control group (2b) (Mean ± SD: 0.125±0.054).

Table (13): comparison between CDGP (8) and control group (2b) as regards difference in years between estimated bone age and the chronological age.

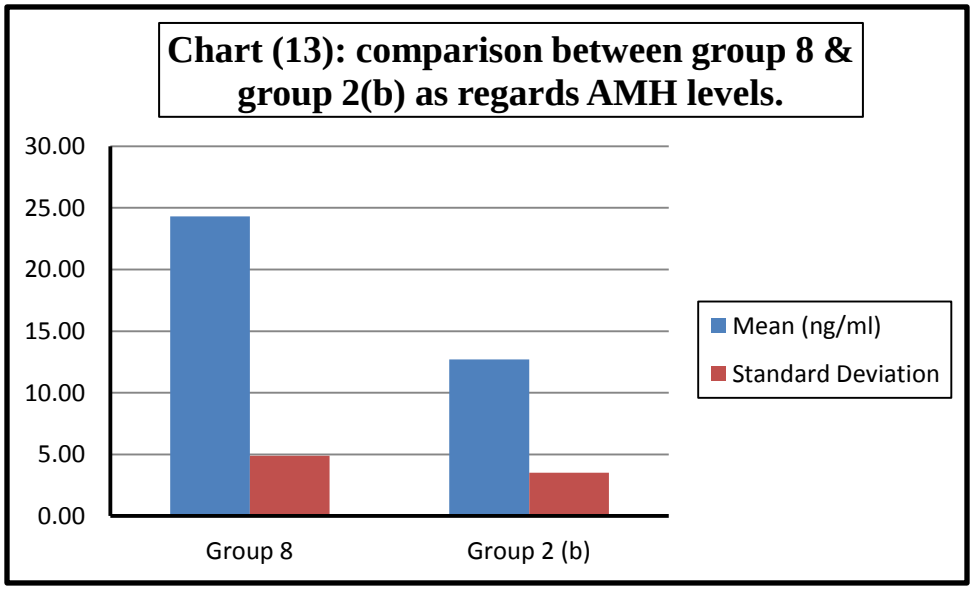
Difference in years	Group 8 n=15	Group 2(b) n=8	T	P	Significance
Mean±SD	1.867±1.366	0.125±0.054	4.905	> 0.001	Highly significant



The AMH was measured in CDGP group (8). Table (14) showed highly significant difference between patients of CDGP group (8) and age matched control group of healthy boys (2b) as regards AMH levels.

Table (14): comparison between group (8) and group (2b) as regards AMH levels.

AMH level (ng/ml)	Group 8 n=15	Group 2 (b) n=8	T	P	Significance
Mean±SD	24.3±4.90	12.70±3.50	5.91	<0.001	Highly significant



The AMH level was in CDGP group (8) of prepubertal levels as those of group (1) (table 15), and group (2a) (table 16).

Table (15): comparison between group (8) and group (1) as regards AMH levels.

AMH level (ng/ml)	Group 8 n=15	Group 1 n=15	T	P	Significance
Mean±SD	24.3±4.90	25.44±5.04	0.62	> 0.05	Non-significant

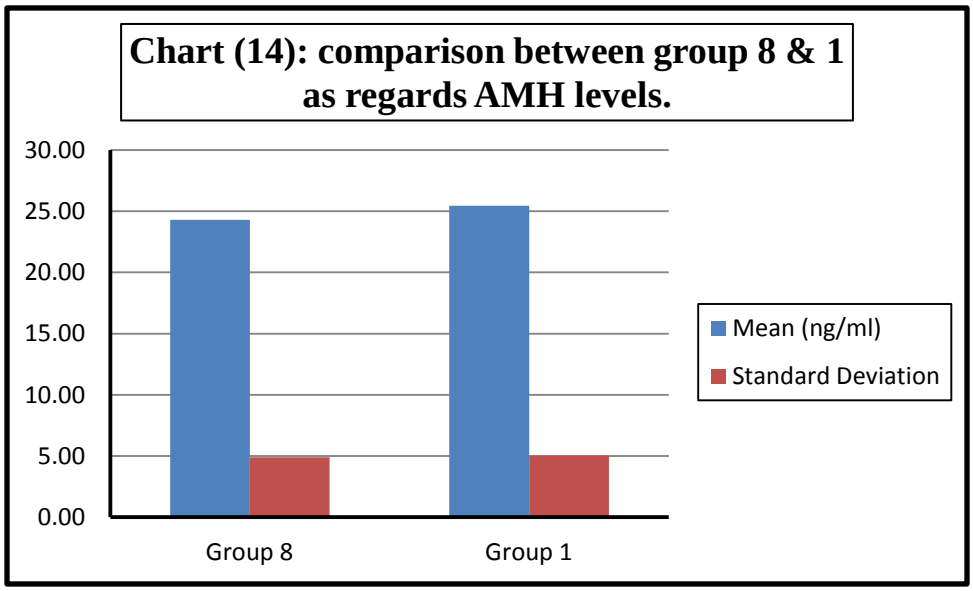


Table (16): comparison between group (8) and group (2a) as regards AMH levels.

AMH level (ng/ml)	Group 8 n=15	Group 2 (a) n=7	T	P	Significance
Mean±SD	24.3±4.90	24.20±4.90	0.214	> 0.05	Non-significant

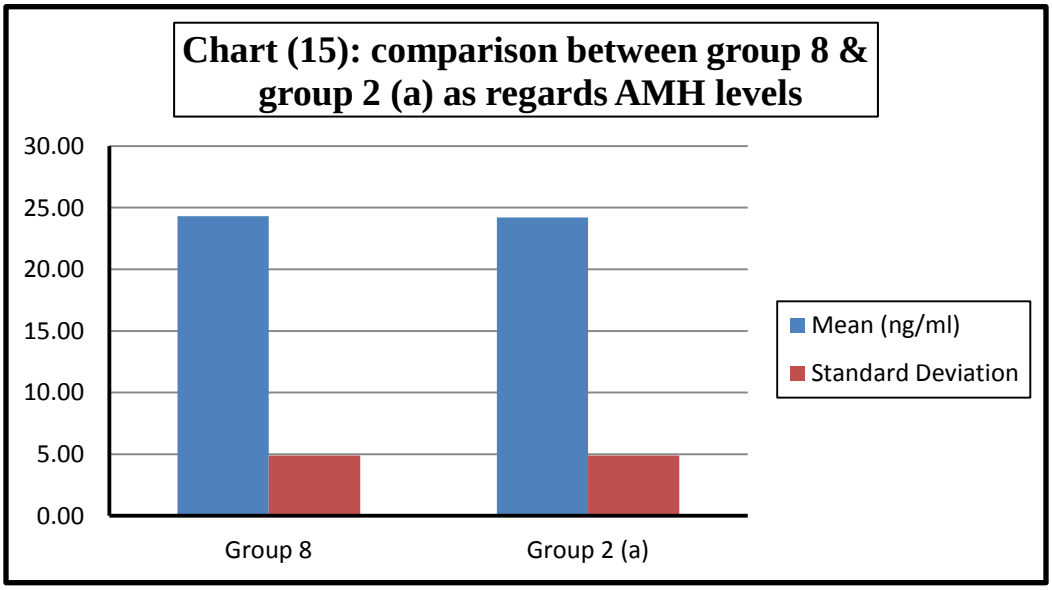


Figure (6): plain X ray of patient no (106). Bone age was 12 years and the chronological age was 14 years.

Figure (7): plain X ray of patient no (108). Bone age was 12.5 years and the chronological age was 14 years.

Figure (8): plain X ray of patient no (111). Bone age was 13 years and the chronological age was 15 years.

Figure (9): plain X ray of patient no (116). Bone age was 15 years and the chronological age was 16.5 years.