IV

Results

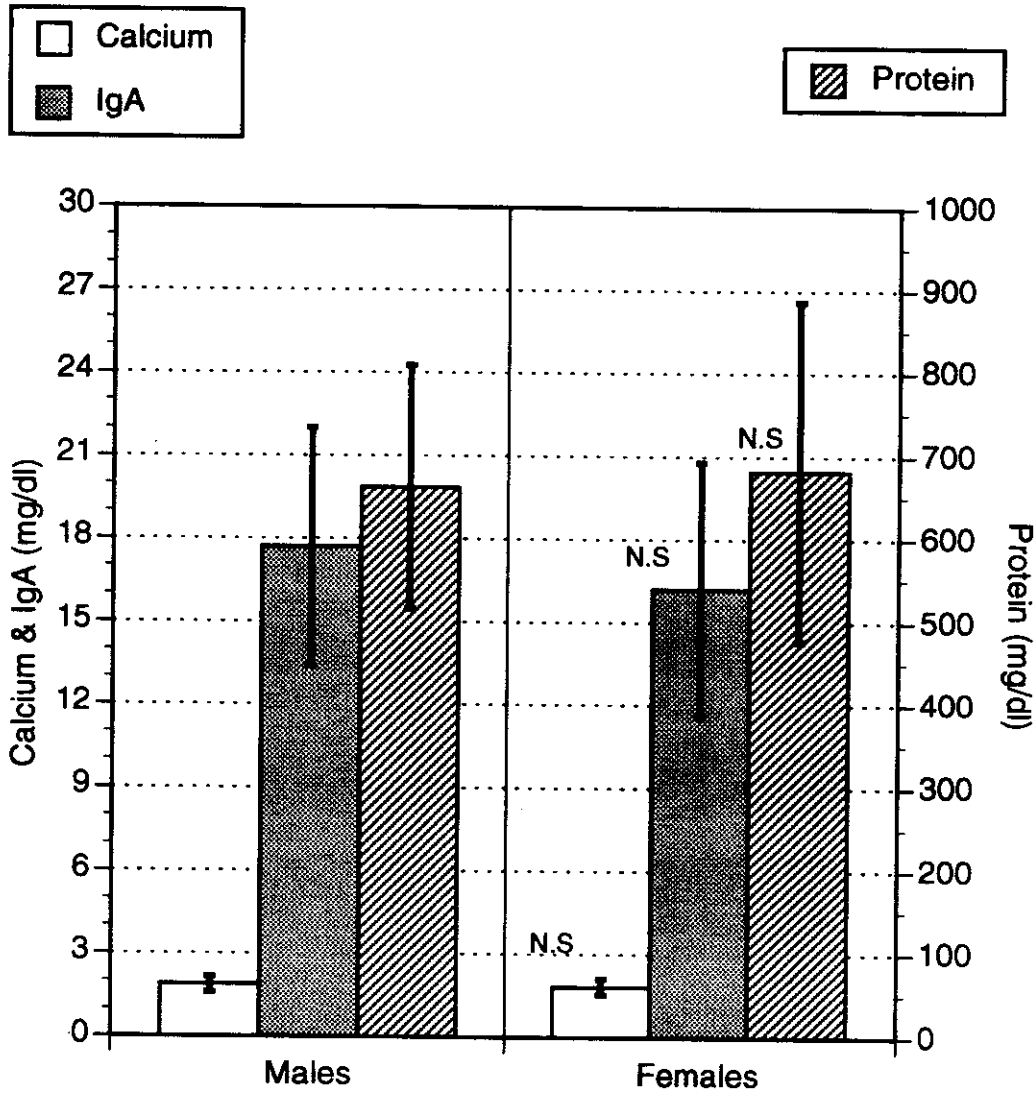

Fig. (1): *Difference in mean values ±S.D of tear calcium, protein, and IgA between male & female non-C.L wearers (control group).*

N.S = Not significant

Table (2) and Fig. (1) show the difference in the mean values ±SD of calcium, total protein and IgA in tears between male and female normal non-contact lens wearers.

Male samples have a mean calcium value of 1.88 ±0.29 mg/dl, with a range from 1.36 to 2.31 mg/dl. Female samples have a mean calcium value of 1.83 ±0.29 mg/dl, with a range from 1.28 to 2.31 mg/dl.

Male mean total protein value in tears is 662 ±146.2 mg/dl, with a range from 435 to 945 mg/dl, while female mean value is 682.5 ±204.7 with a range from 360 to 1250 mg/dl.

Male mean IgA value in tears is 17.7 ±4.3 mg/dl, with a range from 11.5 to 23.2 mg/dl. Female mean IgA value is 16.2 ±4.6 mg/dl, with a range from 10.2 to 24.9 mg/dl.

Sex differences is found to be statistically insignificant.

Table (2): Difference in the mean values ±SD of tear calcium, total protein and IgA between male and female normals subjects.

Sex	No of eyes	Calcium (mg/dl)	Protein (mg/dl)	IgA (mg/dl)
Male	20	1.88 ±0.29 (1.36–2.31)*	662 ±146.2 (435–945)*	17.7 ±4.3 (11.5–23.2)*
Female	30	1.83 ±0.29 (1.28–2.31)*	682.5 ±204.7 (360–1250)*	16.2 ±4.6 (10.2–24.9)*
P value		>0.05	>0.05	>0.05

* Range.

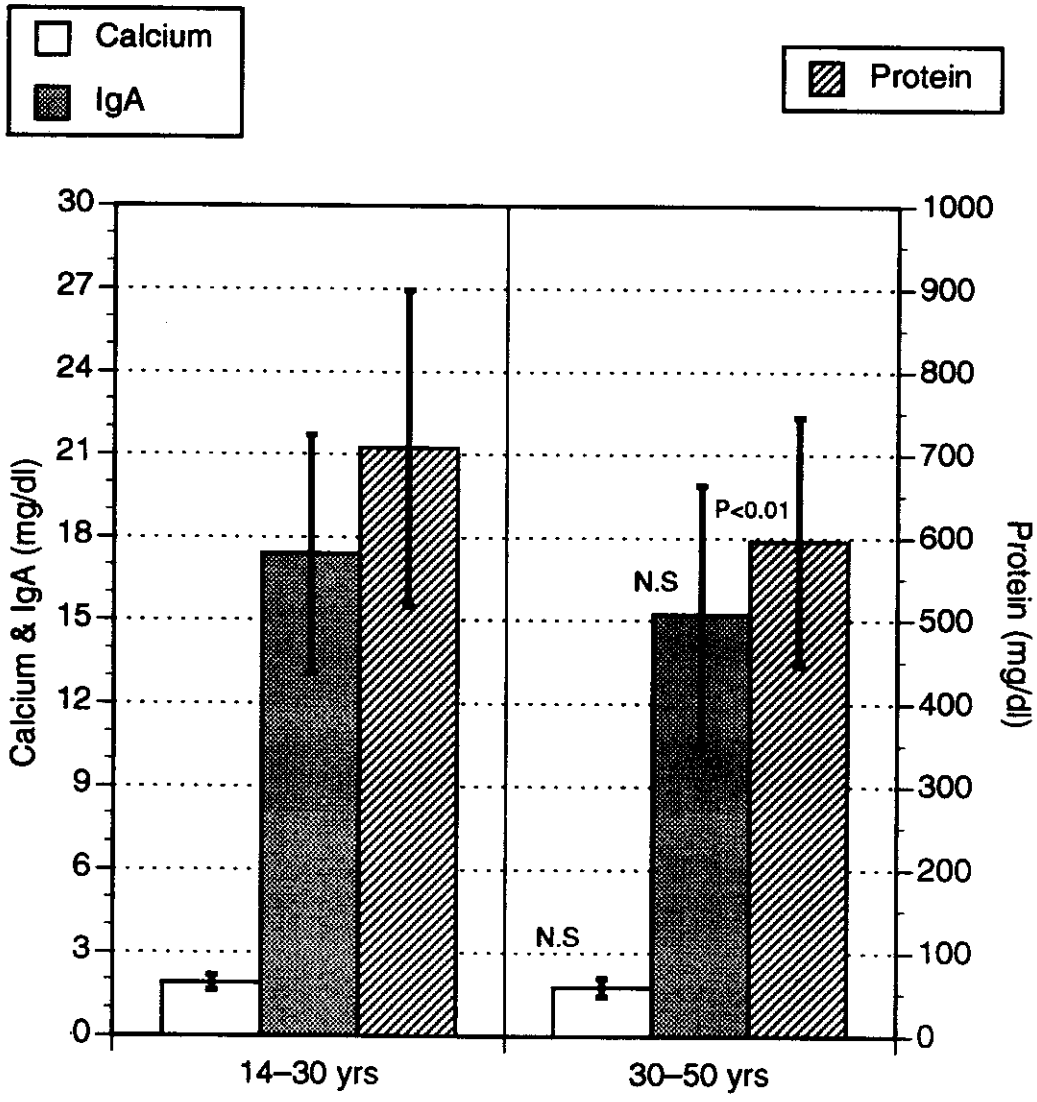

Fig. (2): *A comparison between mean values ±S.D of tear calcium, protein, and IgA; and different age groups of normal subjects.*

N.S = Not significant

In Table (3) and Fig. (2) a comparison between mean values of tear calcium, protein and IgA in two different age groups (14–30 years and 30–50 years) shows that protein values are significantly decreased with increasing age. Calcium and IgA values shows an insignificant decrease with increasing age.

Table (3): A comparison between mean values ±SD of tear calcium, protein and IgA in different age groups of normal subjects.

Age group	Calcium (mg/dl)	Protein (mg/dl)	IgA (mg/dl)
14–30 years n = 33	1.89 ±0.27	707.8 ±190.7	17.4 ±4.3
30–50 years n = 14	1.74 ±0.34	596.0 ±149.3	15.2 ±4.7
P value	>0.05	<0.01	>0.05

Group II (New S.C.L Wearers)

Daily S.C.L Wearers

The results of tear analysis of new daily soft contact lens wearers is shown in Table (4) and Fig. (3). The mean values of the first sample collected prior to contact lens fitting are: tear calcium 1.92 ±0.27 mg/dl, tear protein 688.1 ±133.8 mg/dl and tear IgA is 16.2 ±2.9 mg/dl.

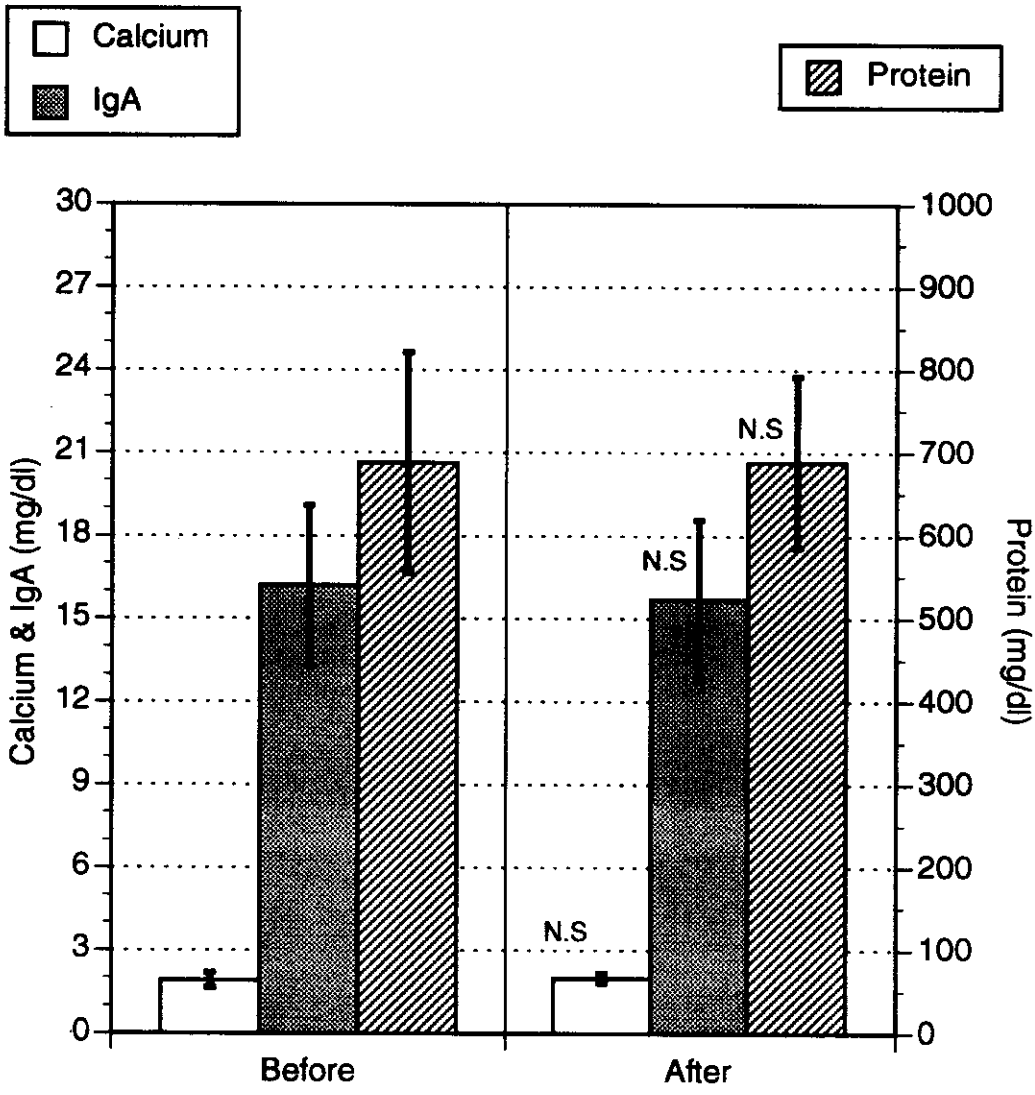

Fig. (3): *Difference between mean values ±S.D of tear calcium, protein, & IgA in new daily S.C.L wearers before fitting & six months after lens wear.*

N.S = Not significant

The second sample shows a mean value of: tear calcium 1.99 ±0.18 mg/dl, tear protein 689.0 ±103.0, and tear IgA 15.7 ±2.9 mg/dl.

Table (4): Difference between mean values ±SD of tear calcium protein and IgA in new daily S.C.L wearers before fitting and six months after lens use.

	Calcium (mg/dl)	**Protein (mg/dl)**	**IgA (mg/dl)**
Before n = 22	1.92 ±0.27 (1.54–2.46)*	688.1 ±133.8 (415–945)*	16.2 ±2.9 (11.0–21.5)*
After n = 22	1.99 ±0.18 (1.72–2.46)*	689.0 ±103.0 (510–890)*	15.7 ±2.9 (11.5–21.0)*
P value	>0.05	>0.05	>0.05

* Range.

The differences between the mean values before and after daily soft contact lens wear are statistically insignificant.

Extended S.C.L Wearers

Table (5) and Fig. (4) show the results of tear analysis in new extended soft lens wearers before fitting and after six months of lens use. Prior to lens wear the mean values of calcium, protein and IgA in tears were 1.75 ±0.34 mg/dl; 602.2 ±170.5 mg/dl; and 15.3 ±3.4 mg/dl respectively. Six months after lens wear on a weekly basis the second

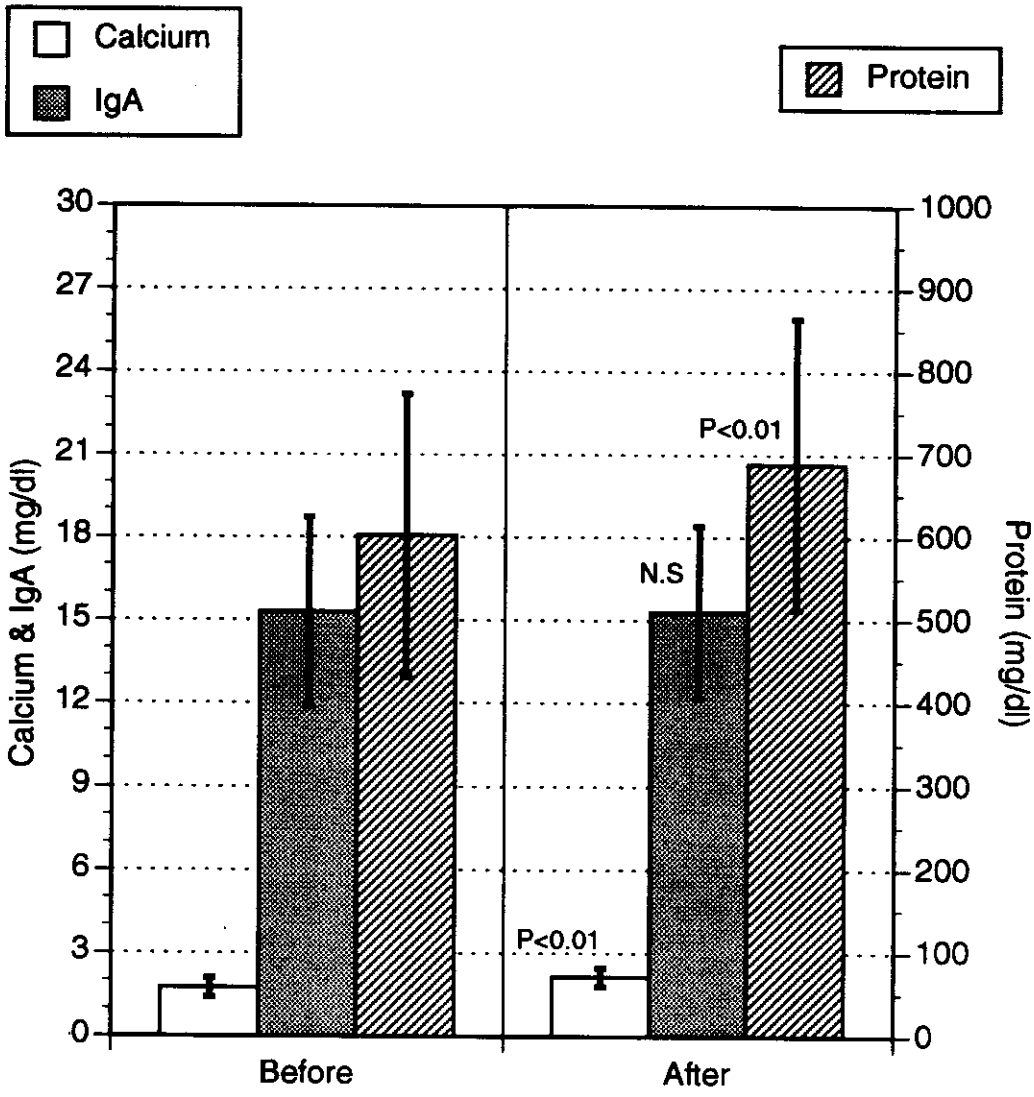

Fig. (4): *Difference between mean values ±S.D of tear calcium, protein, & IgA in new E.W.S.C.L wearers before fitting & six months after lens wear.*

N.S = Not significant

sample shows a significantly elevated values for tear calcium and tear protein of 2.13 ±0.34 mg/dl and 688.6 ±175.6 mg/dl (P <0.01).

Table (5): Differences between mean values ±SD tear calcium, protein, and IgA in new E.S.C.L wearers before fitting and six months after lens use.

	Calcium (mg/dl)	Protein (mg/dl)	IgA (mg/dl)
Before n = 18	1.75 ±0.34 (1.24–2.36)*	602.2 ±170.5 (370–1130)*	15.3 ±3.4 (10.2–24.0)*
After n = 18	2.13 ±0.34 (1.54–2.89)*	688.6 ±175.6 (410–1150)*	15.3 ±3.1 (10.5–22.8)*
P value	<0.01	<0.01	>0.05

* Range.

However, IgA concentrations did not differ after lens wear as compared to value before lens fitting.

Group III (Asymptomatic S.C.L Wearers for more than a Year)

Table (6) and Fig. (5) show a comparison between tear calcium, protein and IgA in non-contact lens wearers and asymptomatic S.C.L wearers for more than a year.

Daily S.C.L Wearers

Daily lens wearers (28 eyes) had the following mean values: tear calcium 1.93 ±0.28 mg/dl, tear protein 682.3 ±116.6 mg/dl and tear IgA

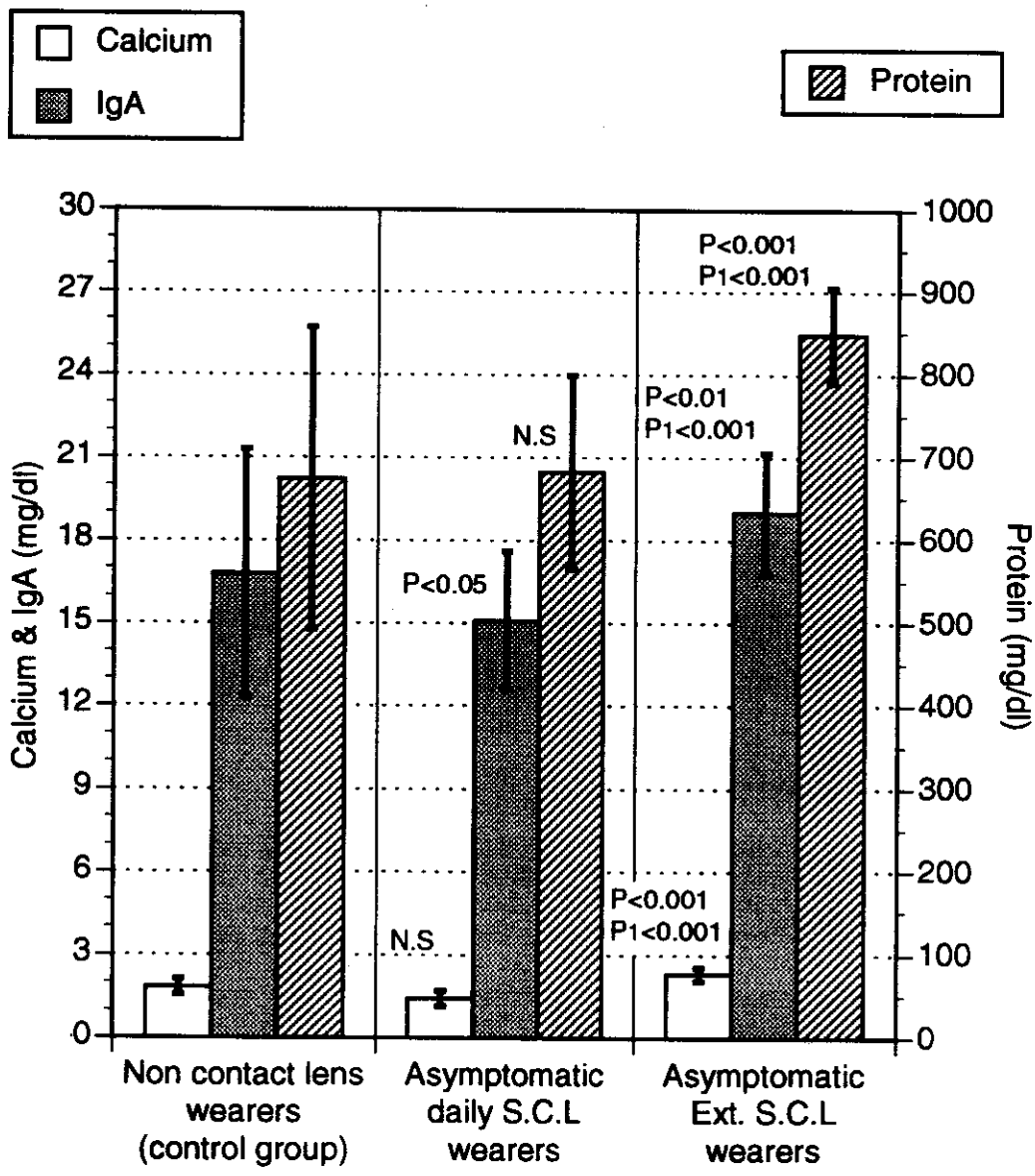

Fig. (5): *Comparison in mean values ±SD of tear calcium, protein and IgA between non contact lens wearers, asymptomatic daily S.C.L wearers & asymptomatic extended S.C.L wearers for more than a year.*

N.S = Not significant
P1 = Asymptomatic daily wearers vs. asymptomatic ext. wearers.

was 15.1 ±2.5 mg/dl. In comparing these levels with that of non-contact lens wearers, it showed that tear calcium and protein were not affected, while IgA levels showed a significant decrease (P <0.05).

Extended S.C.L Wearers

Extended lens wearers (14 eyes) had the following mean values: tear calcium 2.32 ±0.24 mg/dl, tear protein 848.2 ±57.7 mg/dl, and tear IgA 19.0 ±2.2 mg/dl. IgA value was found significantly elevated (P <0.01), and both calcium and protein values were highly significantly elevated (P <0.001) in comparison to non-contact lens wearers. The differences in values of tear calcium, protein and IgA between daily and extended asymptomatic lens wearers were highly significant (P_1 <0.001).

Table (6): Difference in mean values ±SD of tear calcium, protein and IgA between non-contact lens wearers and asymptomatic S.C.L wearers for more than a year.

Group	Calcium (mg/dl)	Protein (mg/dl)	IgA (mg/dl)
Non-contact lens wearers n = 50	1.85 ±0.29	674.3 ±182.2	16.8 ±4.5
Vs asymptomatic	1.93 ±0.28	682.3 ±116.6	15.1 ±2.5
daily S.C.L.W n = 28	P >0.05	P >0.05	P <0.05
Vs asymptomatic	2.32 ±0.24	848.2 ±57.7	19.0 ±2.2
extended S.C.L.W	P <0.001	P <0.001	P <0.01
n = 14	P_1 <0.001	P_1 <0.001	P_1 <0.001

*P_1 = Asymptomatic daily wearers vs asymptomatic extended wearers.

n = no. of eyes.

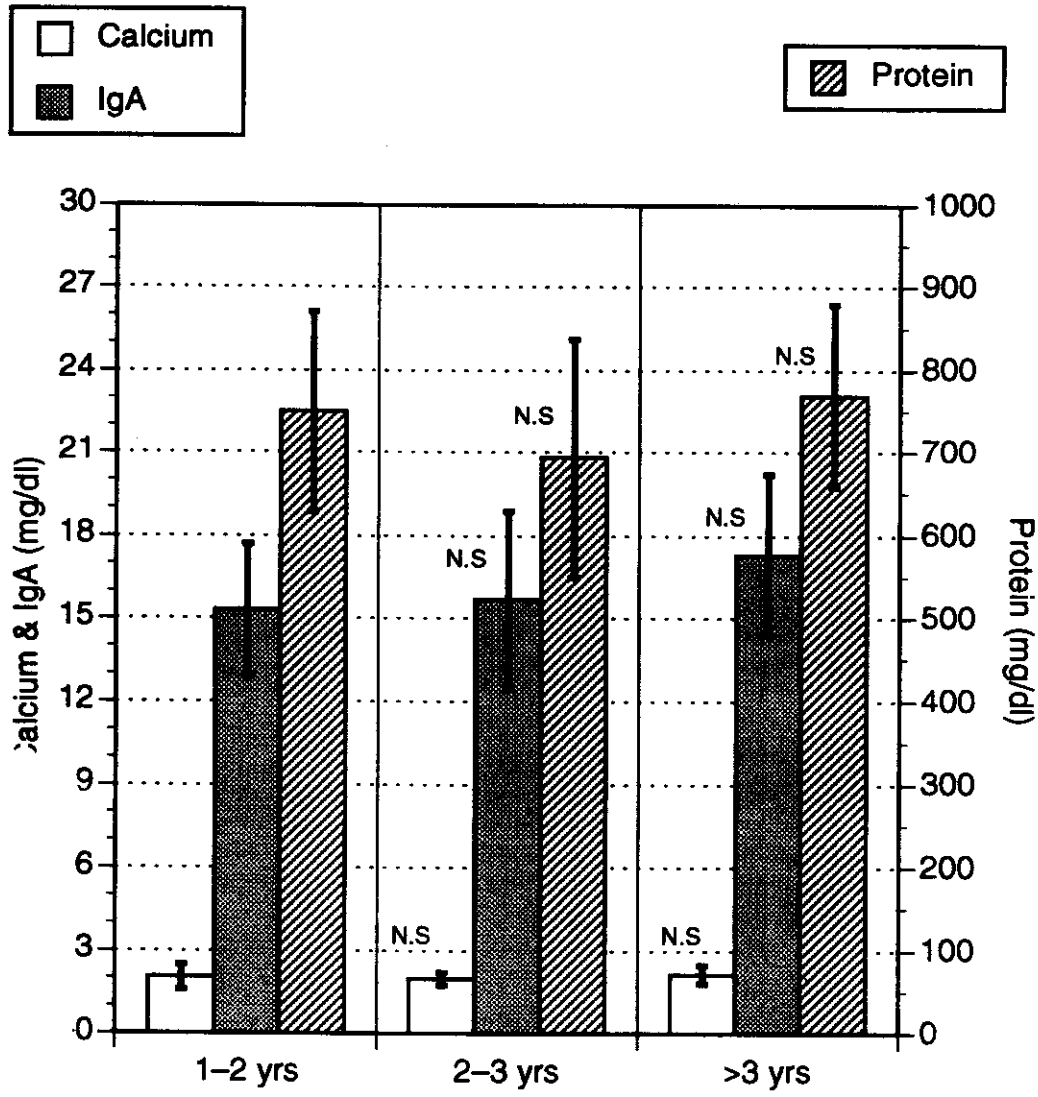

Fig. (6): ***Mean values ±S.D of tear calcium, protein, and IgA with different length of soft C.L wear in asymptomatic wearers.***

N.S = Not significant

However, there was no relation between the levels of tear calcium protein and IgA in asymptomatic wearers and the length of contact lens wear as shown in Table (7) and Fig. (6).

Table (7): Mean values ±SD of tear calcium, protein, and IgA with different length of soft contact lens wear in asymptomatic wearers.

Length of lens wear (yrs)	No of eyes	Calcium (mg/dl)	Protein (mg/dl)	IgA (mg/dl)
1–2	6	2.04 ±0.44	750 ±120.8	15.3 ±2.4
2–3	16	1.98 ±0.24	693.7 ±144	15.7 ±3.2
>3	20	2.15 ±0.34	769 ±110.4	17.3 ±2.9
P value		>0.05	>0.05	>0.05

Group IV (Symptomatic S.C.L Wearers for more than a Year)

Table (8) and Fig. (7) show the difference in mean values ±SD of tear calcium protein and IgA between non contact lens wearers and symptomatic S.C.L wearers for more than a year.

Daily S.C.L Wearers

Daily lens wearers show a mean calcium value of 2.95 ±0.64 mg/dl, a mean protein value of 843.4 ±113.0 mg/dl, and a mean IgA value of 19.9 ±3.5 mg/dl in their tears respectively. In comparing these

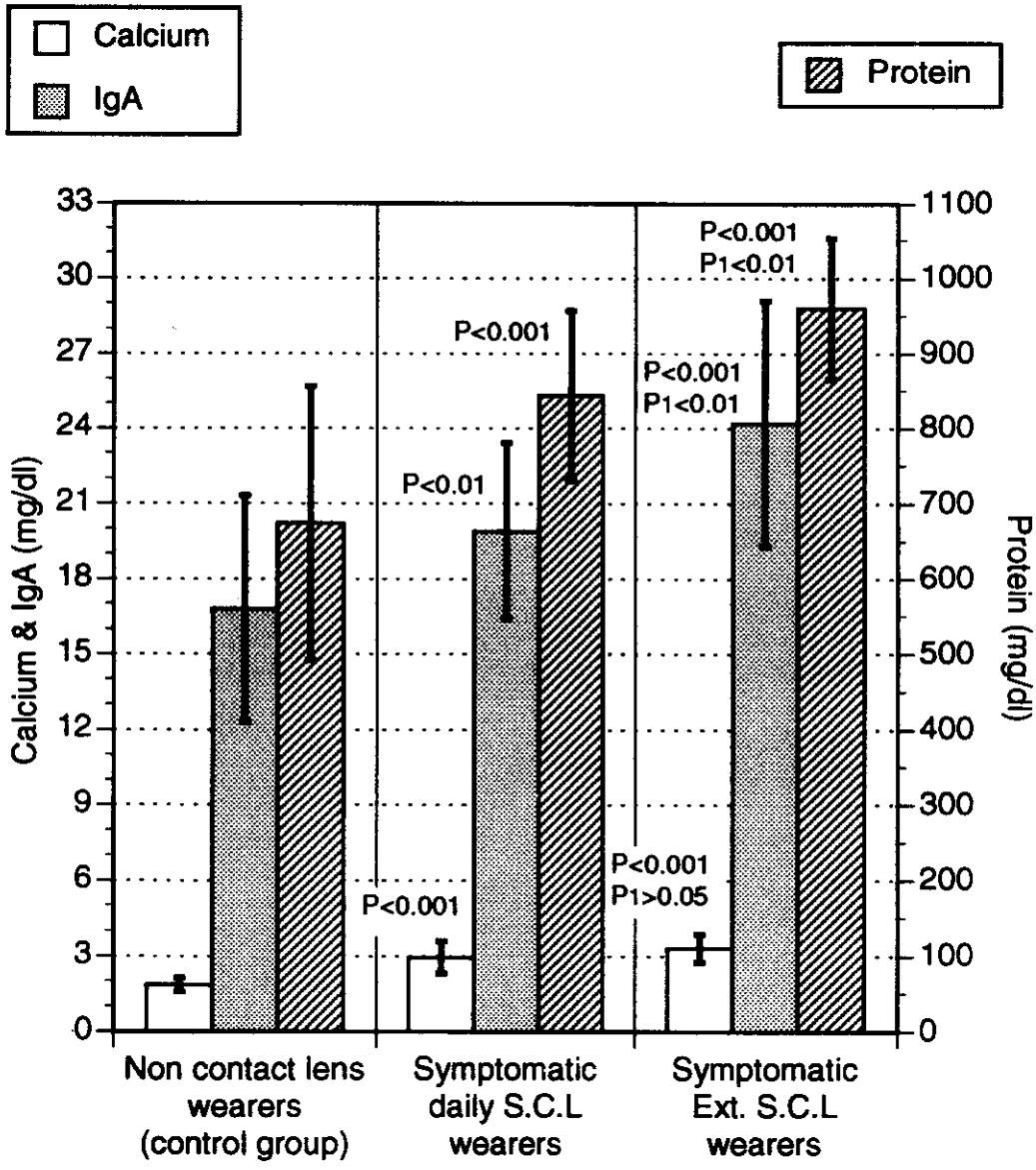

Fig. (7): *Comparison in mean values ±SD of tear calcium, protein and IgA between non contact lens wearers, symptomatic daily S.C.L wearers & symptomatic extended S.C.L wearers.*

N.S = Not significant
P1 = Symptomatic daily wearers vs. symptomatic ext. wearers.

levels with that of non-cotanct lens wearers, it showed a highly significant elevation (P <0.001).

Extended S.C.L Wearers

Extended lens wearers had the following mean values: calcium 3.32 ±0.55 mg/dl, protein 960.2 ±93.3 mg/dl, and IgA 24.2 ±4.9 mg/dl. In comparing these values to that of non-contact lens wearers, it was significantly highly elevated (P <0.001).

The difference in values of tear calcium, protein and IgA between daily and extended symptomatic lens wearers showed that tear protein and IgA were significantly elevated in extended lens wearers (P_1 <0.01).

Table (8): Difference in mean values ±SD of tear calcium, protein and IgA between non-contact lens wearers and symptomatic S.C.L wearers for more than a year.

Group	Calcium (mg/dl)	Protein (mg/dl)	IgA (mg/dl)
Non-contact lens wearers n = 50	1.85 ±0.29	674.3 ±182.2	16.8 ±4.5
Vs symptomatic daily S.C.L.W n = 16	2.95 ±0.64 P <0.001	843.4 ±113.0 P <0.001	19.9 ±3.5 P <0.01
Vs symptomatic extended S.C.L.W n = 17	3.32 ±0.55 P <0.001 P_1 >0.05	960 ±93.3 P <0.001 P_1 <0.01	24.2 ±4.9 P <0.001 P_1 <0.01

*P_1 = Symptomatic daily wearers vs symptomatic extended wearers.
n = no. of eyes.