RESULTS

I- Histological Picture(After Haematioxylin and eosin):

1- *Control Picture:*

The choroid plexuses appeared as highly tortuous vascular processes projecting into the brain ventricles.Each process has many leaf-like projections (villi).The villi were cut at different planes. Each villous was formed of simple cuboidal epithelium surrounding a small core of loose connective tissue with blood capillaries (Fig. 1).

2- *First group (after a single extremely large dose of vitamin A):*

Choroid plexus of the animals of this group showed dilatation and engorgement of the blood vessels (Fig. 2).

3- *Second group (After 1 month of contrinuous injections of vitamin A):*

Choroid plexus of the animals of this group showed also dilatation and engorgement of the blood vesels but to a lesser degree than those observed in the first group (Fig.3).

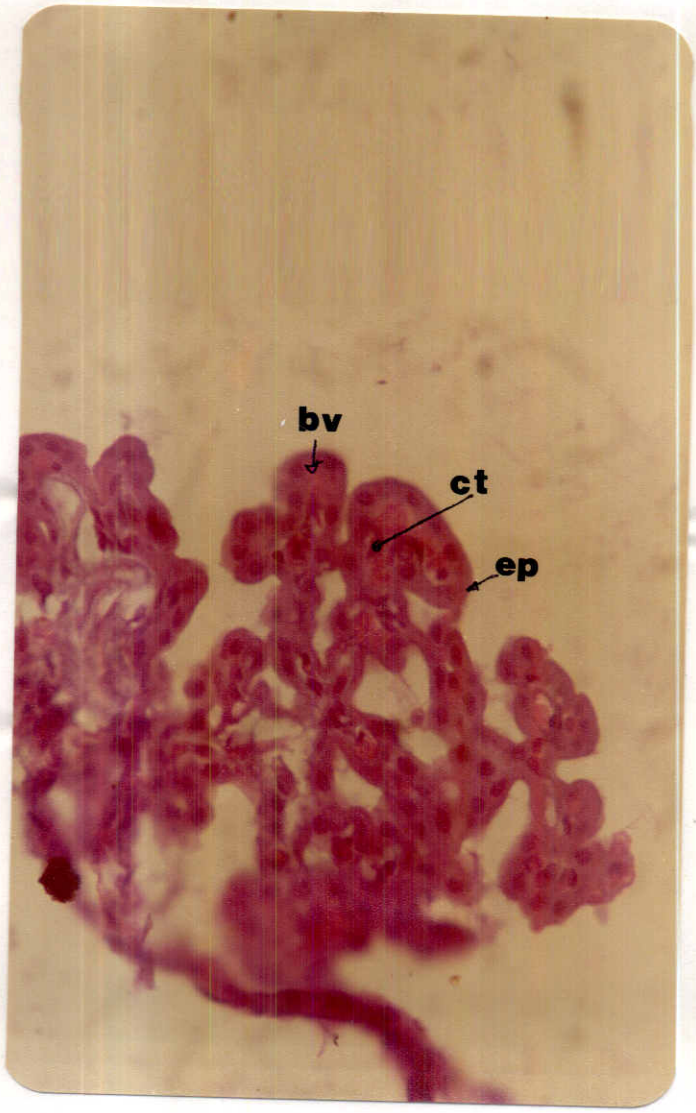

Fig. (1): A photomicrograph of a section in the choroid plexus of a lateral ventricle of a *control* animal showing a *tortuous process with simple cuboidal epithelium* **(EP)** *surrounding a small core of loose conective tissue* **(CT)** *with blood capillaries* **(BV).**

(Hx. & E. Proj.: 10 Obj.: 40)

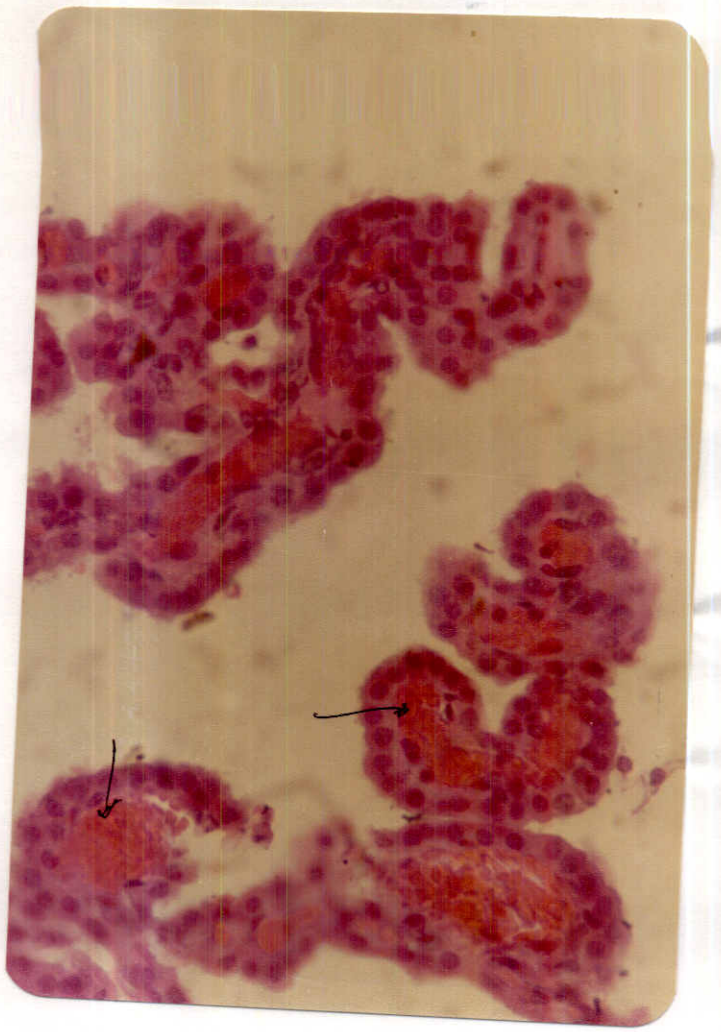

Fig. (2): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected with a *single extremely large dose* of vitamin A showing *dilatation and engorgement of the blood capillaries (arrows).*

(Hx. & E. Proj.: 10 Obj.: 40)

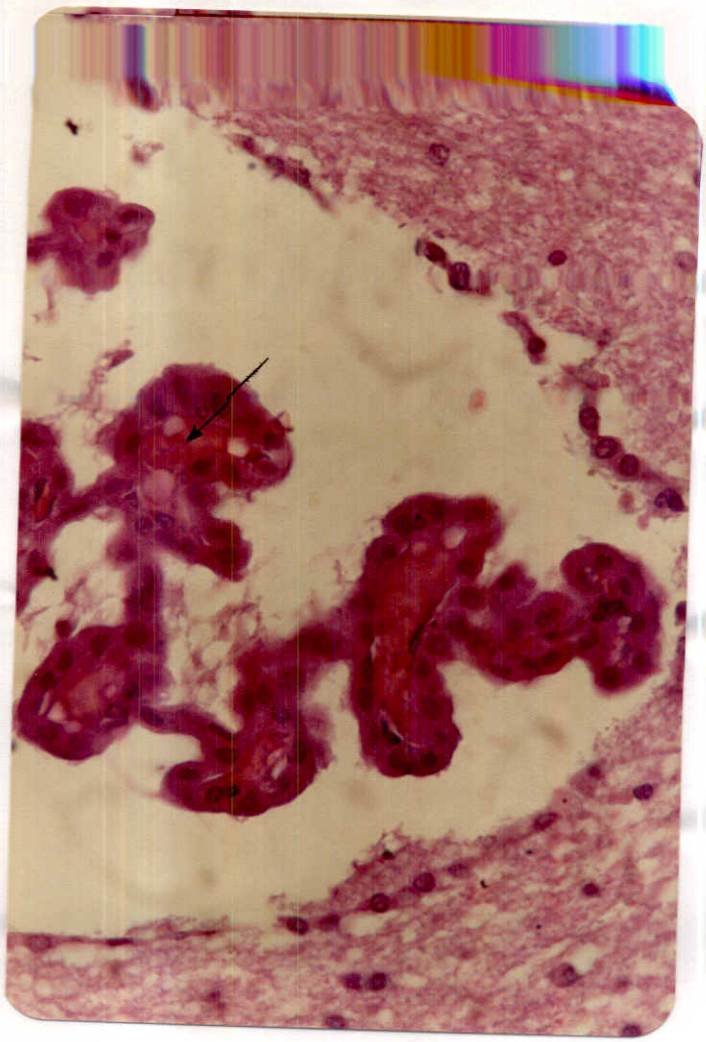

Fig. (3): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected daily with vitamin A for one month showing *mild dilatation and engorgement of the blood capillaries (arrows).*

(Hx. & E. Proj.: 10 Obj.:40)

4- *Third group (after 2 months of continuous injections of vitamin A):*

These animals showed dilatation and engorgement of the blood vessels of the choroid plexus more marked than in the previous two groups (Fig. 4).

5- *Fourth group (after 3 months of continuous injections of vitamin A):*

These animals showed more and more marked dilataiton and engorgement of the blood vessels of the choroid plexus than in the previous three groups (Fig. 5).

6- *After stopping the injection:*

Animals kept for 5 days after the single injection and for 5 weeks after the prolonged injections (1,2,3 months) showed no difference from the control picture (Fig. 6).

7- *After injection with arachus oil alone:*

Animals injected with arachus oil alone in all groups showed no change from the control picture.

II-Histochemical Picture (Table 1):-

(A) Adenosine triphosphatase:-

1- *Control picture:*

In the cuboidal epithelial cells, weak enzyme activity was found at the basal part of the cytoplasm and at the

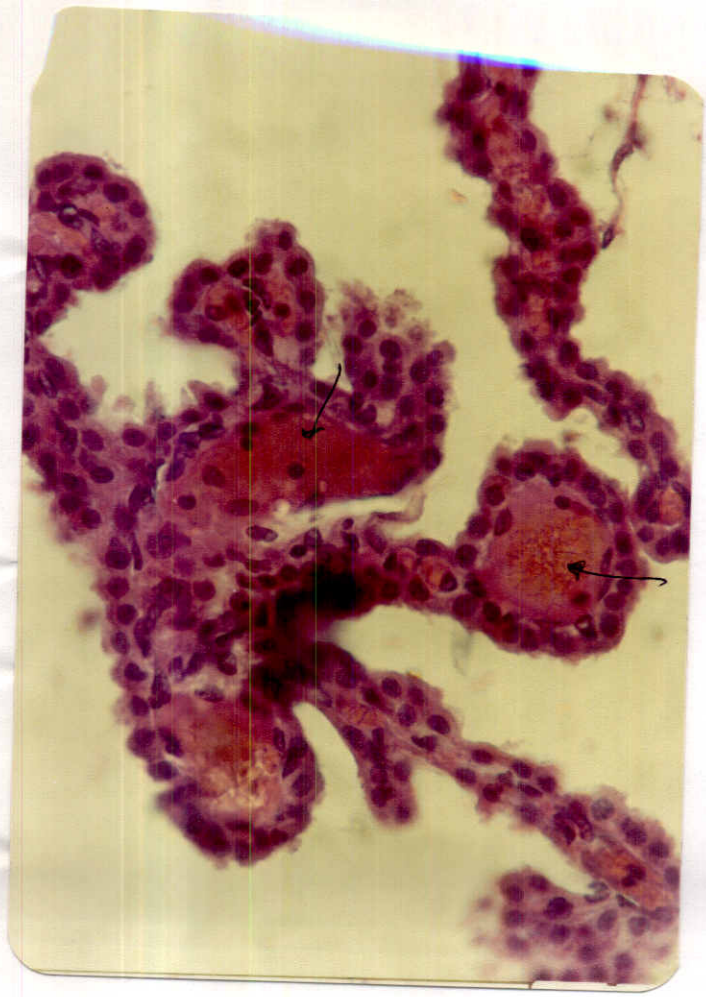

Fig. (4): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected daily with vitamin A for two months showing more marked dilatation and engorgement of the blood capillaries (arrows).

(Hx. & E. Proj.: 10 Obj.: 40)

Fig. (5): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injectd daily with vitamin A for *three months* showing *more and more marked dilatation and engorgement of the blood capillaries (arrows).*

(Hx. & E. Proj.: 10 Obj.: 40)

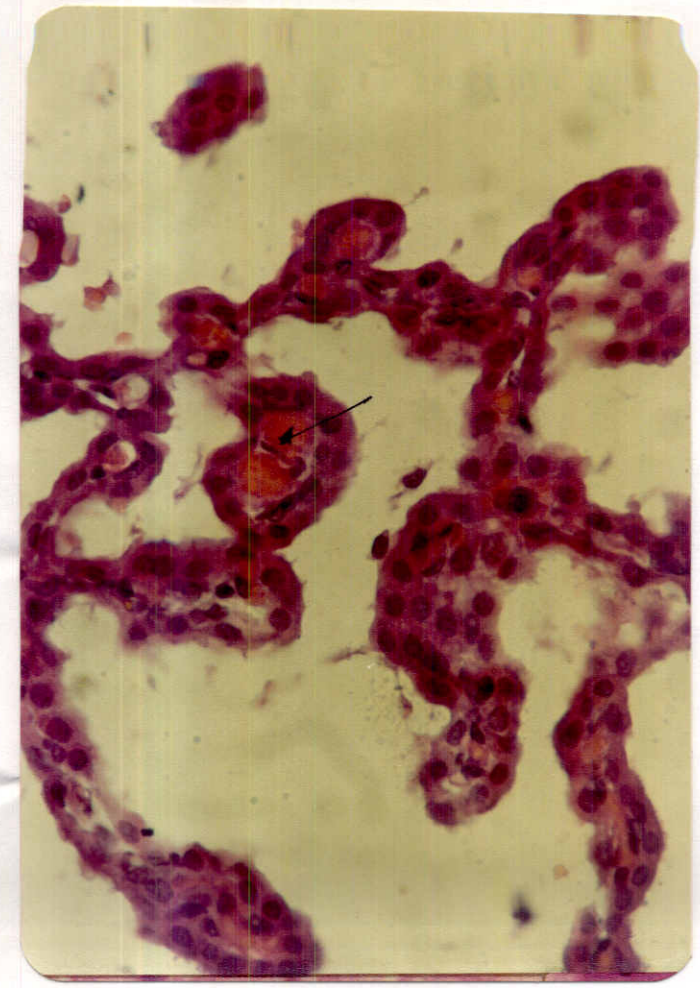

Fig. (6): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected with vitamin A for three months and the brain was dissected out after five weeks of stopping injection showing no difference from the control picture (arrows).

(Hx. & E. Proj.: 10 Obj.: 40)

apical cell membrane. The nuclei, particularly nucleoli, showed a moderate reaction.

The stroma, blood vessels and R.B.Cs. showed a strong enzyme activity (Fig. 7).

2- *First group (after a single extremely large dose of vitamin A):*

The activity of the enzyme became strong in the whole cytoplasm, the apical cell membrane and the nuclei of the epithelial cells.

Enzyme reaction in the stroma, blood vessels, and R.B.Cs. remained strong (Fig. 8).

3- *Second group (after 1 month of continuous injections of vitamin A):*

The enzyme activity started to increase to include the whole cytoplasm of the cuboidal epithelial cells. The apical membrane showed weak reaction. The nuclei remained moderate reaction.

Enzyme reaction in the stroma, blood vessels, and R.B.Cs. remained strong (Fig. 9).

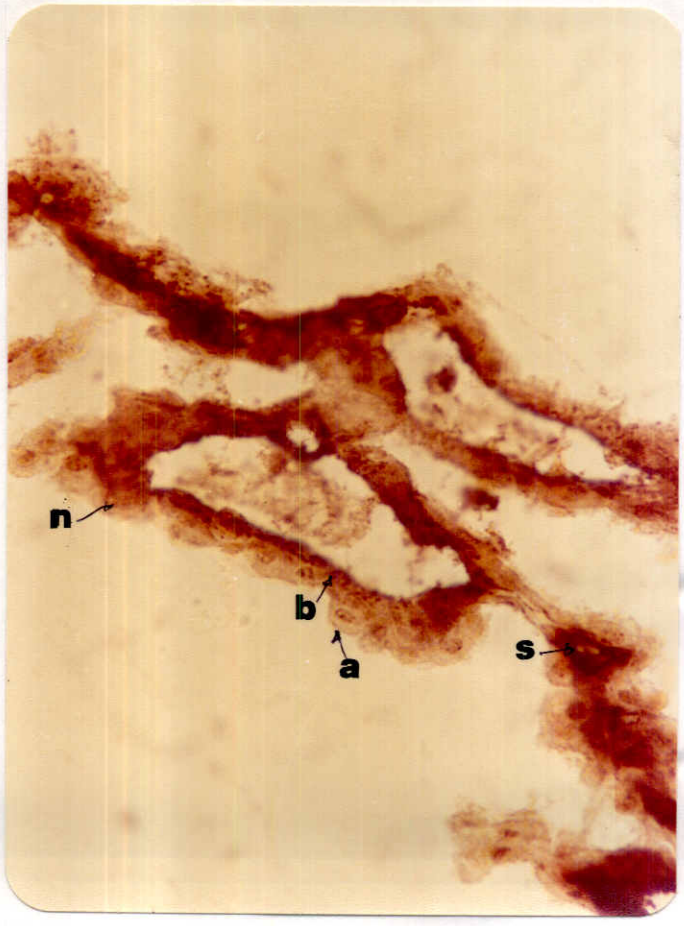

Fig. (7): A photomicrograph of a section in the choroid plexus of a lateral ventricle of a *control* animal showing a *strong reaction of A.T.P.ase in the stroma, blood vessels and R.B.C.s* **(S)**. *The nuclei* **(N)** *particularly the nucleoli showed amoderate reaction. The basal part of the epithelial cells* **(B)** *and the apical cell membrane* **(A)** *revealed weak reaction.*

(Wachstein and Meisel Lead method for A.T.P.ase.
Proj.: 10 Obj.: 40)

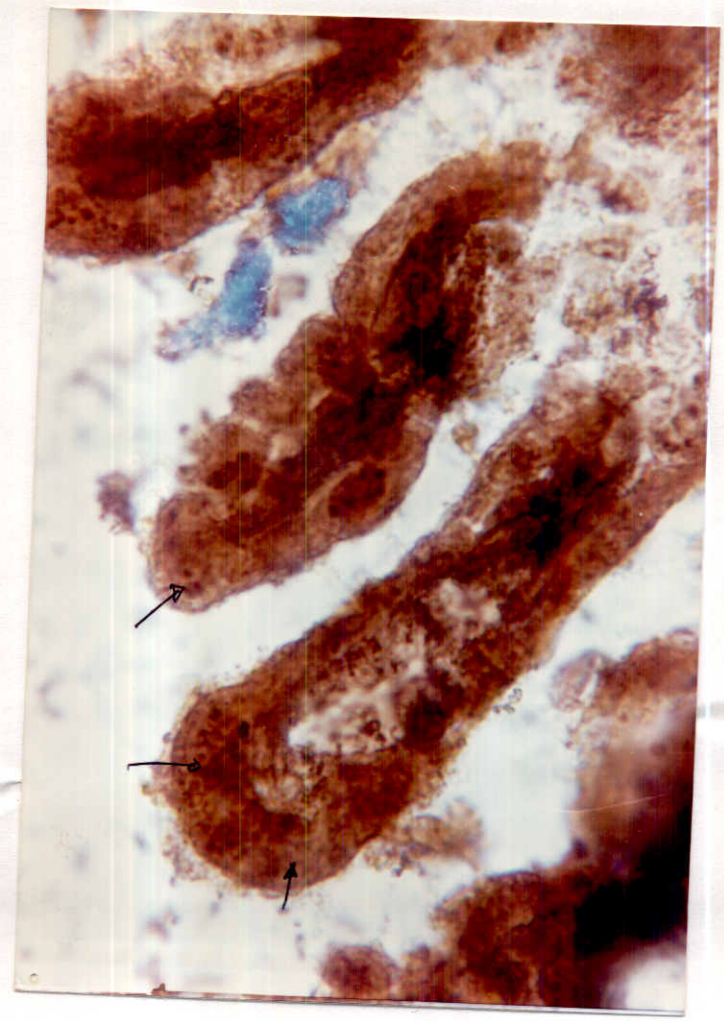

Fig. (8): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected with *a single extremely large dose* of vitamin A showing *strong A.T.P.ase activity in the epithelial cells extending to the apical border (Arrows).*

(Wachstein & Meisel Lead method for A.T.P.ase. Proj.: 10 Obj.: 100)

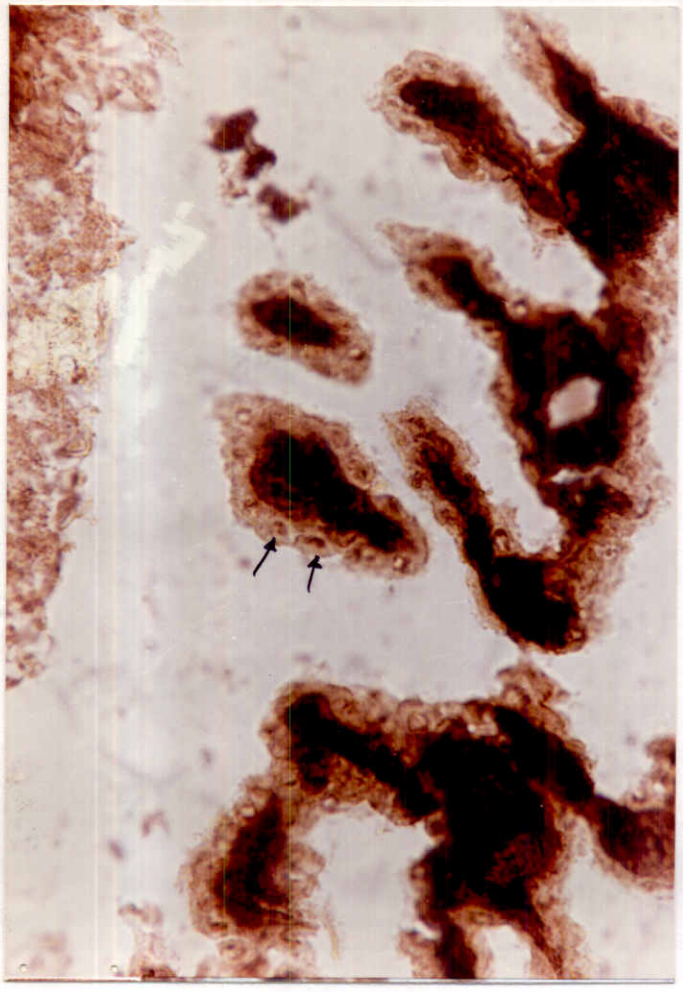

Fig. (9): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected with vitamin A for *one month* showing *extension in the reaction of the A.T.P.ase in the epithelial cells to the apical border (arrows).* (Wachstein & Meisel Lead method for A.T.P.ase Proj.: 10 Obj.: 100)

4- *Third group (after 2 months of continuous injections of vitamin A):*

The cytoplasm and the apical membrane of the cuboidal epithelial cells showed moderate increase of the enzyme activity. The nuclei showed strong reaction.

Stroma, blood vessels and R.B.Cs. showed an intense enzyme activity (Fig. 10).

5- *Fourth group (After 3 months of continuous injection of vitamin A):*

The cytoplasm and the apical membrane of the cuboidal epithelial cells showed strong increase in the enzyme activity.

Stroma, blood vessels and R.B.Cs. showed an intense enzyme reaction.

6- *After stopping the injection of vitamin A :*

Animals kept for 5 days after the single injection of vitamin A and for 5 weeks after the prolonged injections (1,2,3 months) showed a return to the control picture (Fig.11).

7- *After injection with arachus oil alone:*

Animals injected with arachus oil alone in all groups showed no change from the control picture.

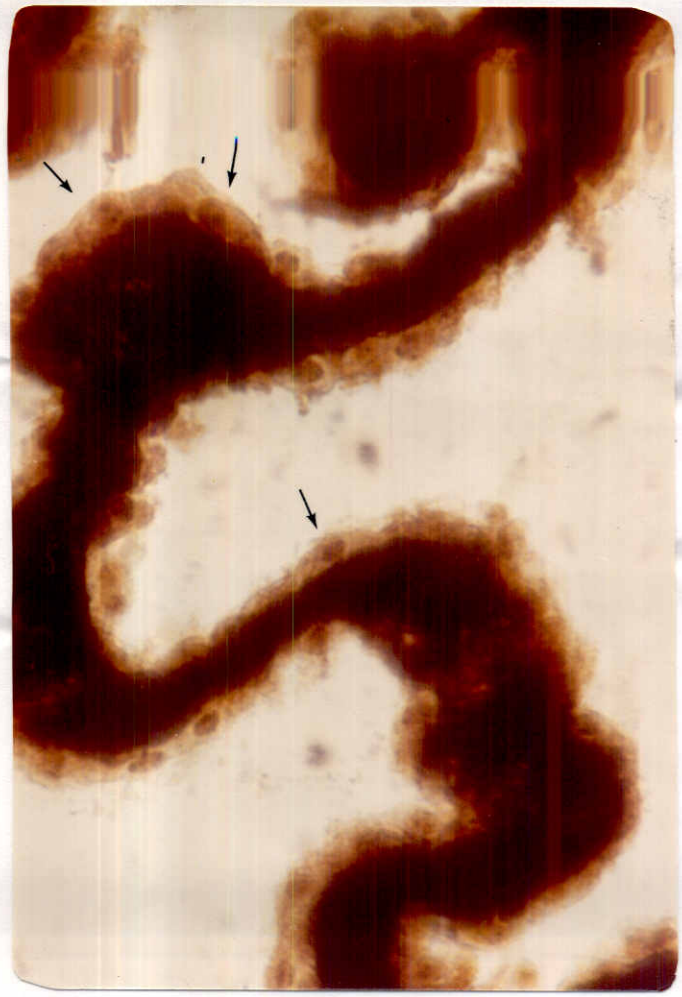

Fig. (10): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected with vitamin A for two months showing a moderate increase in the A.T.P.ase activity in the epithelial cells (arrows). The nuclei showed strong reaction. The stroma showed an intense increase in the enzyme activity.

(Wachstein & Meisel Lead method for A.T.P.ase

Proj.: 10 Obj.: 100)

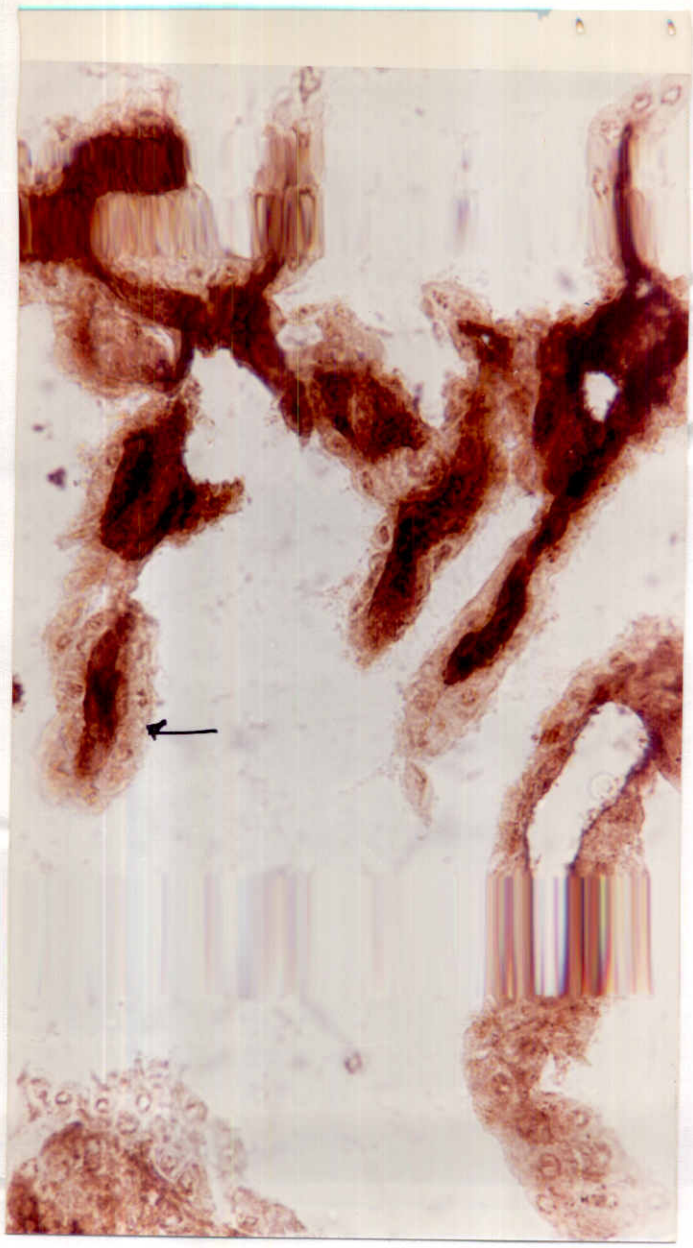

Fig. (11): A photomicrograph of a section in the choroid plexus of a lateral ventricle of an animal injected with vitamin A for three months and the brain was dissected out five weeks after *stopping* injection showing *a return to the control picture (arrows)*.

(Wachstein & Meisel Lead method for A.T.P.ase Proj.: 10 Obj.: 100).

B- Carbonic Anyhydrase:-

1- *Control Picture:*

In the epithelial cells weak enzyme reaction appeared on the outer cell membrane. No reaction was observed inside the cells or on the lateral cell membranes.

Weak carbonic anhydrase reaction was found also in the stroma, blood vessels and R.B.Cs. (Fig. 12).

2- *First group (after a single extremely large dose of vitamin A):*

The enzyme activity increased on the outer cell membrane and in the stroma to a strong degree.

3- *Second group (after 1 month of continuous injections of vitamin A):*

No change from the control picture could be detected.

4- *Third group (after 2 months of continuous injections of vitamin A):*

The enzyme activity increased on the outer cell membrane of the cuboidal epithelial cells and in the stroma to a moderate degree (Fig. 13).

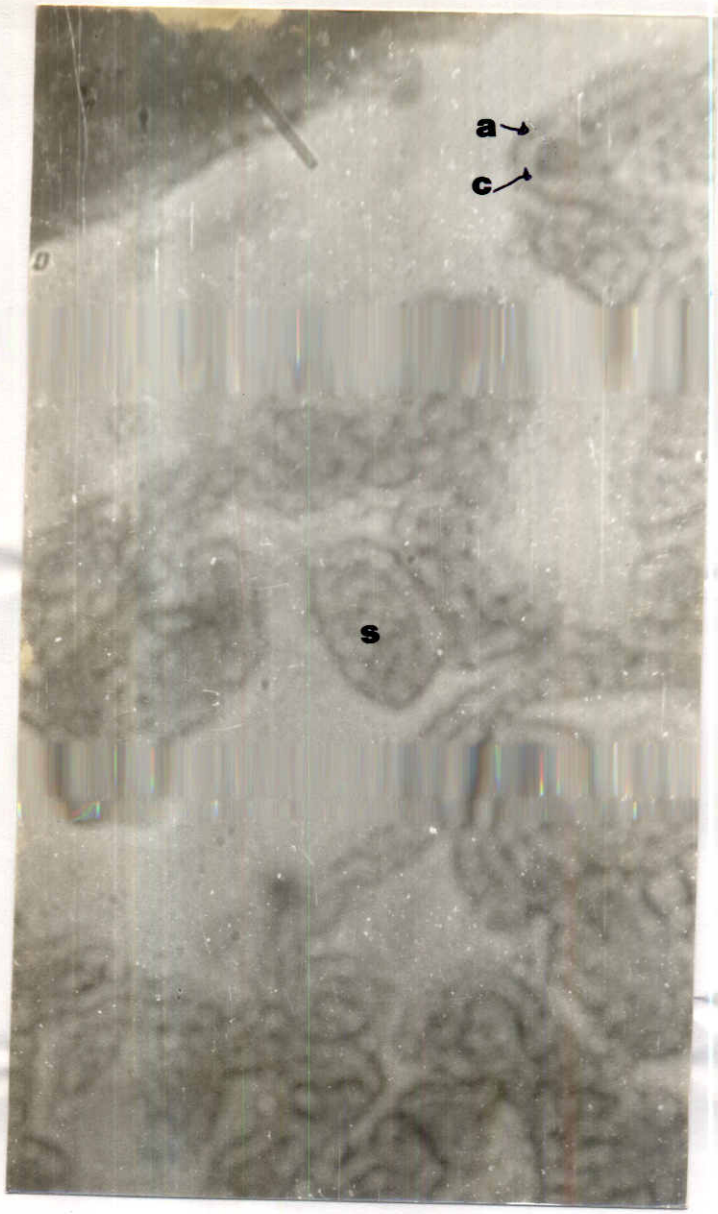

Fig. (12): A photomicrograph of a section in the choroid plexus of a lateral ventricle of a *control* animal showing a *weak carbonic anhydrase activity at the apical part of the epithelial cells* **(A)** *and in the stroma* **(S)**.

(Hausler method for carbonic anhydrase

Proj.: 10 Obj.: 40).

N.B. The cytoplasm of the epithelial cells **(C)** showed no reaction.

Fig. (13): A photomicrograph of a section in the choroid plexus of an animal injected for two months vitamin A showing a moderate increase in the activity of carbonic anhydrase at the apical border of epithelial cells (A) and the stroma (S).

(Hausler method for carbonic anhydrase

Proj.: 10 Obj.: 10).

5- *Fourth group (after 3 months of continuous injections of vitamin A):*

The enzyme activity increased on the outer cell membrane of the cuboidal epithelial cells and in the stroma to a strong degree (Fig. 14).

6- *After stopping the injection:*

Animals kept for 5 days after the single injection and for 5 weeks after the prolonged injections (1,2,3 months) showed a reture to the control picture.

7- *After injection with arachus oil alone:*

Animals injected with arachus oil alone in all groups showed no change from the control picture.

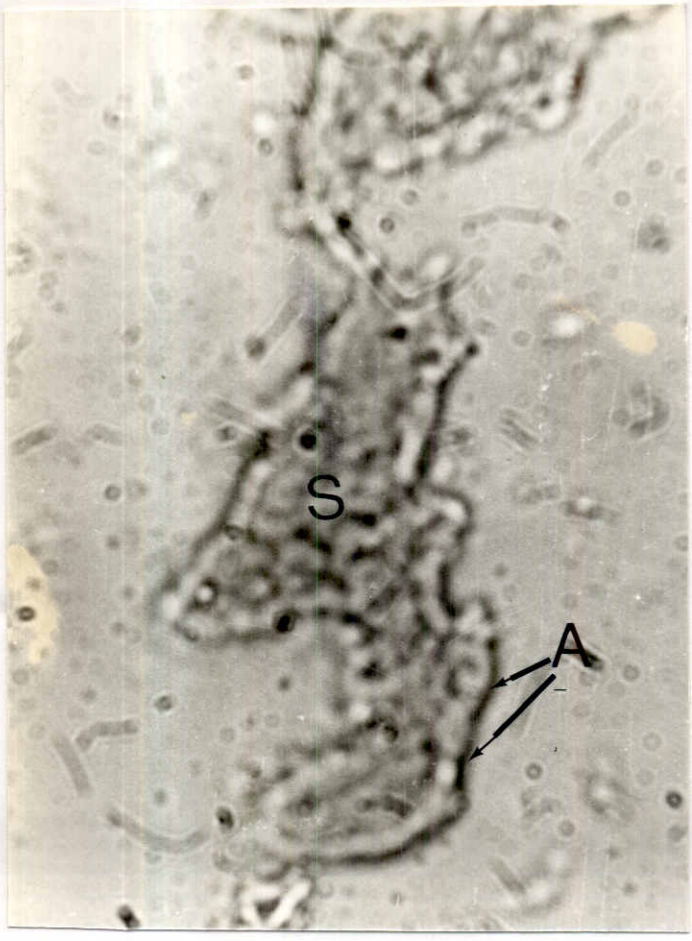

Fig. (14): A photomicrograph of a section in the choroid plexus of a lateral vetricle of an animal injected with vitamin A for *three months* showing a *strongly increased activity of carbonic anhydrase at the apical border of the epithelial cells* **(A)** *and in the stroma* **(S).**

(Hausler method for carbonic anhydrase

Proj.: 10 Obj.: 40).

Table 1:

The distribution and intensity of reaction of enzymes in the choroid plexuses of the different animal groups.

ANIMAL GROUP	A. T. P.ase.					C. A.ase.		
	St.	Cyto.		A.C. Mem.	N.	St.	Cyto.	A.C. Mem.
		B.	A.					
1- Control picture.	+++	+	-	+	++	+	-	+
2- After the single large injection.	+++	+++	+++	+++	+++	+++	-	+++
3- After 1 month of vitamin injections.	+++	+	+	+	++	+	-	+
4- After 2 months of vitamin injections.	+++	++	++	++	+++	++	-	++
5- After 3 months of vitamin injections.	++++	+++	+++	+++	+++	+++	-	+++
6- After stopping injection.	+++	+	-	+	++	+	-	+
7- After arachus oil injection.	+++	+	-	+	++	+	-	+

St.= Stroma Cyto.= Cytoplasm B.= Basal part

A.= Apical part A.C.Mem.= Apical cell membrane N.= Nucleus

A.T.P.ase.= Adenosine triphosphatase C.A.ase.= Carbonic anhydrase

- = Negative + = Weak ++ = Moderate +++ = Strong ++++= Intense