TABLE (I)

Summary of Results

Case No.	V.A.	Age	Sex	Duration of D	Type of D	Clinical diagnosis	Fluor. diagnosis
1	4/60	47	F	13	Non	PDR, macular oedema, macular exudates (hard)	PDR, cystoid maculopathy, macular ischaemia.
2	6/6	35	F	10	In	PDR, free macula	PDR, focal maculopathy.
3	6/6	45	F	10	Non	BDR, free macula	BDR, buckground maculopathy.
4	6/24	50	F	15	Non	PDR, suspected macular ischaemia	PDR, diffuse maculopathy macular ischaemia.
5	6/18	35	M	17	In	BDR	PPDR, focal maculopathy, ischaemia.
6	6/24	35	F	10	Non	BDR,	BDR, background maculopathy
7	6/9	54	M	15	Non	BDR	BDR, background maculopathy.
8	6/36	55	F	8	Non	BDR, hard exudates (discrete)	PPDR, focal maculopathy, macular ischaemia.
9	6/9	25	M	14	In	PPDR, soft exudates	PPDR, diffuse maculopathy.
10	6/24	53	M	20	Non	PDR, discrete exudates (hard)	PDR, diffuse maculopathy, ischaemia.

TABLE (1): Cont.

Case No.	V.A.	Age	Sex	Duration of D	Type of D	Clinical diagnosis	Fluo. diagnosis
11	6/36	55	F	15	Non	BDR, ischaemia is suspected	PPDR, diffuse maculopathy, macular ischaemia.
12	6/9	25	M	14	In	PPDR. soft exudates	PPDR, Background maculopathy.
13	6/60	29	F	12	In	PDR, macular oedema, hard exudates	PDR, cystoid macular oedema ischaemia.
14	6/9	45	F	11	Non	BDR	Focal maculopathy, BDR.
15	6/6	45	F	12	Non	BDR, discrete exudates (hard)	BDR, focal maculopathy.
16	6/9	55	F	13	Non	BDR,	BDR, focal maculopathy macular ischaemia.
17	6/60	55	F	10	Non	PDR, circinate maculopathy, oedema.	PDR, cystoid macular oedema.
18	6/12	55	F	10	Non	BDR, discrete exudates.	BDR, focal maculopathy.
19	6/24	47	F	13	Non	PDR, circinate maculopathy oedema	PDR, cystoid maculopathy, macular ischaemia.
20	6/9	55	F	8	Non	BDR, circinate maculopathy	Focal maculopathy, BDR.

TABLE (I): Cont.

Case No.	V.A.	Age	Sex	Duration of D	Type of D	Clinical diagnosis	Fluo. diagnosis
21	6/60	56	F	15	Non	BDR, discrete exudate, ischaemia	PPDR, diffuse macu-oedema, mocular ischaemia.
22.	6/18	35	M	15	Non	BDR, discrete hard exudate	BDR, focal maculopathy.
23	6/12	51	F	17	Non	BDR	BDR, background maculopathy.
24	6/60	50	F	15	Non	BDR	BDR, diffuse maculopathy.
25	6/12	50	M	16	Non	Normal fundus	BDR, focal maculopathy.
26	3/60	58	M	40	In	PDR, macular oedema, preretinal *membrane*	PDR, fibrovascular membrane, cystoid oedema.
27	6/36	62	M	10	Non	BDR	PPDR, diffuse maculopathy, macular ischaemia.
28	6/60	65	F	25	Non	BDR, circinate maculopathy. oedema.	BDR, cystic macular oedema.
29	6/9	53	M	15	Non	BDR, discrete hard exudates	BDR, focal maculopathy.
30	6/6	27	M	15	In	BDR	BDR, focal maculopathy.
31	6/24	62	F	18	Non	BDR,	BDR, focal maculopathy.

TABLE (I): Cont.

Case No.	V.A	Age	Sex	Duration of D	Type of D	Clinical diagnosis	Fluo. diagnosis
32	6/24	53	F	5	Non	PDR, hard exudates	PDR, focal maculopathy, macular ischaemia.
33	6/6	26	M	14	In	BDR	BDR, focal maculopathy.
34	6/24	60	F	18	Non	PPDR, circinate maculopathy, macular oedema	PPDR, cystic macular oedema.
35	6/12	56	M	20	In	BDR	PPDR, diffuse maculopathy.
36	6/12	32	F	16	In	BDR	BDR, focal maculopathy, ischaemia.
37	6/36	57	F	22	Non	BDR	BDR, Background maculopathy, macular ischaemia.
38	6/6	47	M	20	In	PDR	PDR, focal maculopathy.
39	6/6	24	M	11	In	BDR	BDR, focal maulopathy.
40	6/6	18	M	8	In	BDR	BDR, background maculopathy.
41	5/60	49	F	12	Non	PDR, macular oedema, hard exudates.	PDR, diffuse maculopathy, ischaemia.

TABLE (I) Cont.

Case No.	V.A	Age	Sex	Duration of D	Type of D	Clinical diagnosis	Fluo. diagnosis
42	6/6	34	F	10	In	PDR, free *macula*	PDR, focal maculopathy.
43	6/6	48	F	10	Non	BDR, free macula	BDR focal maculopathy.
44	6/24	50	F	16	Non	PDR, ischaemia "suspected"	PDR, diffuse maculopathy macular ischaemia.
45	6/18	38	M	18	In	BDR	PPDR, diffuse maculopathy, ischaemia.
46	6/24	34	F	8	Non	BDR,	BDR, background maculopathy.
47	6/9	54	M	19	Non	BDR	BDR, focal maculopathy,
48	6/36	55	F	8	Non	BDR, exudates (hard)	PPDR, focal maculopathy macular ischaemia.
49	6/9	22	M	15	In	PPDR, soft exudate	PPDR, diffuse maculopathy.
50	6/18	50	M	20	Non	PDR, hard exudates (discrete)	PDR, diffuse maculopathy. ischaemia.

TABLE (II)

Incidence of different stages of diabetic retinopathy as diagnosed
clinically

Types

Types of diabetic retinopathy	Eyes	
	No.	%
Background diabetic retinopathy	31	62%
Preproliferative diabetic retinopathy	4	8%
Proliferative diabetic retinopathy	14	28%
Clinically free	1	2%
Total	50	100%

TABLE (III)

Incidence of different stages of diabetic maculopathy as diagnosed
clinically

Stage of diabetic maculopathy	Eyes	
	No.	%
Macular oedema	7	14%
Macular ischaemia	4	8%

TABLE (IV)

Comparison between clinically detected and fluorangiographically detected diabetic retinopathy.

	Clinicall detected		Fluor detected	
	No	%	No.	%
Background diabetic retinopathy	31	62%	24	48%
Preproliferative diabetic retinopathy	4	8%	12	24%
Proliferative diabetic retinopathy	14	28%	14	28%

TABLE (V)

Incidence of different stage of diabetic maculopathy according to fluorescein angiography classification

	Eyes	
	No.	%
Background maculopathy	7	14%
Focal macular oedema	23	46%
Diffuse macular oedema	13	26%
Cystoid macular oedema	7	14%
Ischaemic maculopathy	18	36%

TABLE (VI)

Correlation between the stages of diabetic maculopathy and
the stages of diabetic retinopathy as diagnosed fluorangiographically

| | Stage of diabetic retinopathy | | | | | | |
| | Background | | preproliferative | | proliferative | | Total |
	No	%	No.	%	No.	%	No.
Background maculopathy	6	12%	1	2%	-	-	7
Focal macular oedema	16	32%	3	6%	4	8%	23
Diffuse macular oedema	1	2%	7	14%	5	10%	13
Cystoid macular oedema	1	2%	1	2%	5	10%	7
Ischaemic maculopathy	3	16.66%	7	38.88%	8	44.44%	18

TABLE (VII)

Comparison between clinically detected and fluorangiographically
detected diabetic maculopathy.

| | Clinically detected | | fluorangiograph. detected | | | |
	No.	%	No.	%		
Macular oedema	7	14%	43	86%		
			focal,	diffuse,	cystic	
			46%	26%	14%	
Ischaemia	4	8%	18	36%		

TABLE (VIII)

Correlation between macular oedema and exudates in the macular area

Stage of macular oedema	No.	Exudates		Remarks
		No.	%	
Focal macular oedema	23	8	34.78%	hard exudate
Diffuse macular oedema	13	6	46.15%	2 cases, soft ex. 4 cases, hard ex.
Cystoid macular oedema	7	6	85.71%	Hard exudate
Total	50	21		

TABLE (IX)

Correlation between type of diabetes and stages of diabetic maculopathy.

Type of diabetes	No.	Stage of diabetic maculopathy									
		Background		Focal		Diffuse		Cystic		Ischaemic	
		No.	%	No.	%	No.	%	No.	%	No.	%
Isulin dependent	16	2	12.5%	8	50%	4	25%	2	12.5%	3	18.75%
Non-insulin dependent	34	5	14.7%	15	44%	9	26.47%	5	14.7%	15	44%
Total	50	7		23		13		7		18	

TABLE (X)

Correlation between duration of diabetes and stages of diabetic maculopathy.

Duration of diabetes	No.	Stage of diabetic maculopathy									
		Background		Focal		Diffuse		Cystic		Ischaemic	
		No.	%	No.	%	No.	%	No.	%	No.	%
(1 - 10) years	14	4	28.57%	8	57.14%	1	7.14%	1	7.14%	4	28.57%
(11 - 20) years	33	2	6%	15	45.45%	12	36.36%	4	12.12%	13	39.39%
> 20 years	3	1	33.33%					2	66.66%	1	33.33%
Total	50	7		23		13		7		18	

TABLE (XI)

Correlation between visual acuity and stage of diabetic maculopathy.

Visual acuity	No.	Background		Focal		Diffuse		Cystic		Ischaemic	
		No.	%	No.	%	No.	%	No.	%	No.	%
Normal 6/6	10	2	20%	8	80%						
6/6 - 6/12	15	2	13.33%	10	66.66%	3	20%			2	13.33%
6/18 - 6/24	13	2	15.38%	4	30.76%	5	38.46%	2	15.38%	7	53.84%
6/36 - 6/60	9	1	11.11%	1	11.11%	4	44.44%	3	33.33%	7	77.77%
< 6/60	3					1	33.33%	2	66.66%	2	66.66%
Total	50	7		23		13		7		18	

Stage of diabetic maculopathy

TABLE (XII)

Relation between visual acuity and exudates
in the macular area.

| Visual acuity | No. | Exudates | |
		No.	%
Normal (6/6)	10	1	10%
6/9 - 6/12	14	6	42.85%
6/18 - 6/24	13	6	46.15%
6/36 - 6/60	10	6	60%
< 6/60	3	2	66.66%
Total	50	21	

Case No. (1)

Age   : 47 years.

Sex   : female.

Visual acuity   : 4/60.

Type of diabetes: non insulin dependent

Duration of diabetes : 13 years.

Clinical diagnosis   : Fig 2-A.

Fluorangiographic diagnosis : Fig. 2 (B,C,D).

Fig. (2-A)

*Left eye, proliferative diabetic retinopathy, macular oedema,
retinal Hemorrhages.*

Fig. (2-B)

Left eye: Fluorescein angiogram - early phase.

(Fig. 2-C)

Left eye: Fluorescein angiogram - arteriovenous phase.

Fig. (2-D)

Left eye: Fluorescein angiogram - late phase.
Proliferative diabetic retinopathy
Cystoid macular oedema, macular ischaemia

Case No. (3)

Age   : 45 years.
Sex   : female.
Visual acuity : 6/6.
Type of diabetes : Noninsulin dependent.
Duration of diabetes: 10 years.

Clinical diagnosis : Fig. 3-A.

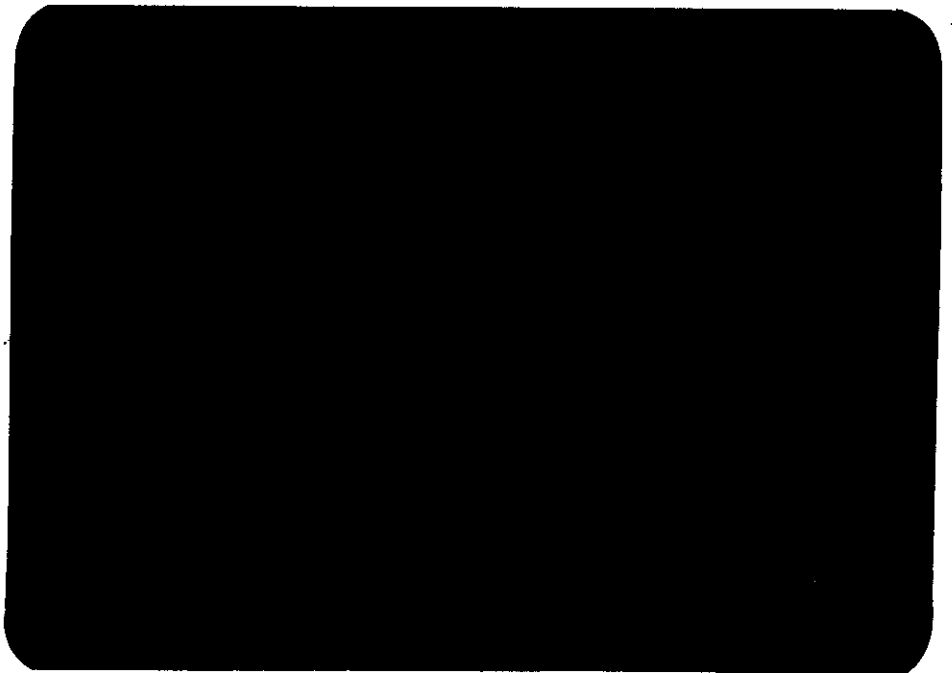Fluorangiographic diagnosis: Fig. 3 (B,C).
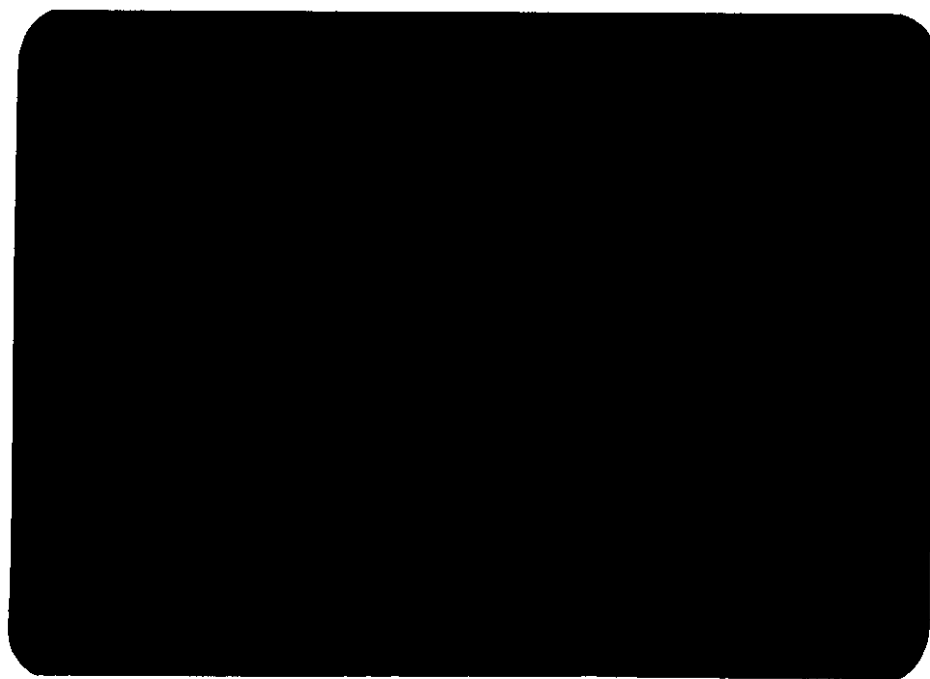
Fig. (3-A)

Right eye: Coloured fundus photograph.
Background diabetic retinopathy. Free macular area.

Fig. (3-B)

Right eye: Fluorescein angiogram, arteriovenous phase.
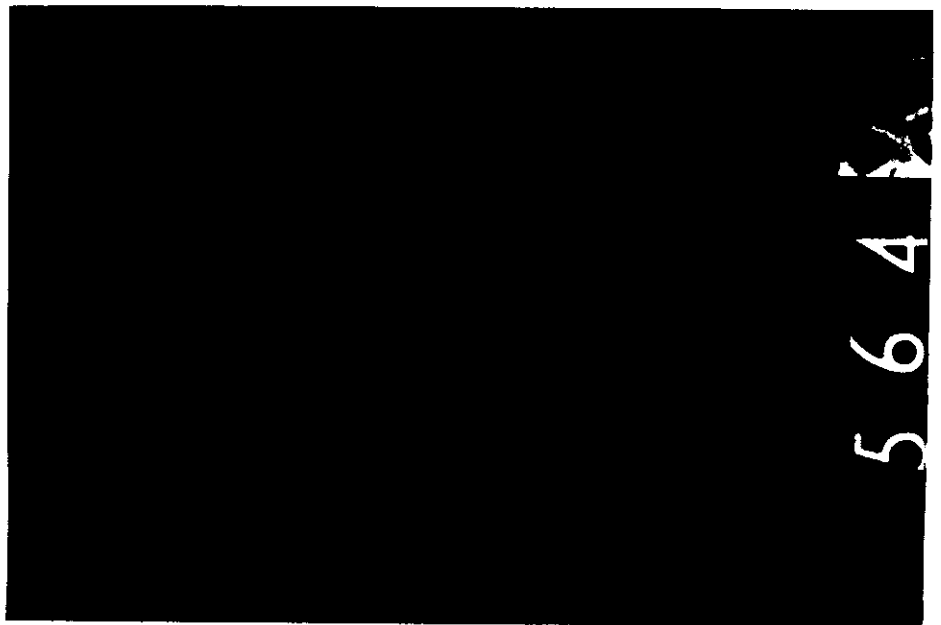
(Fig. (3-C)
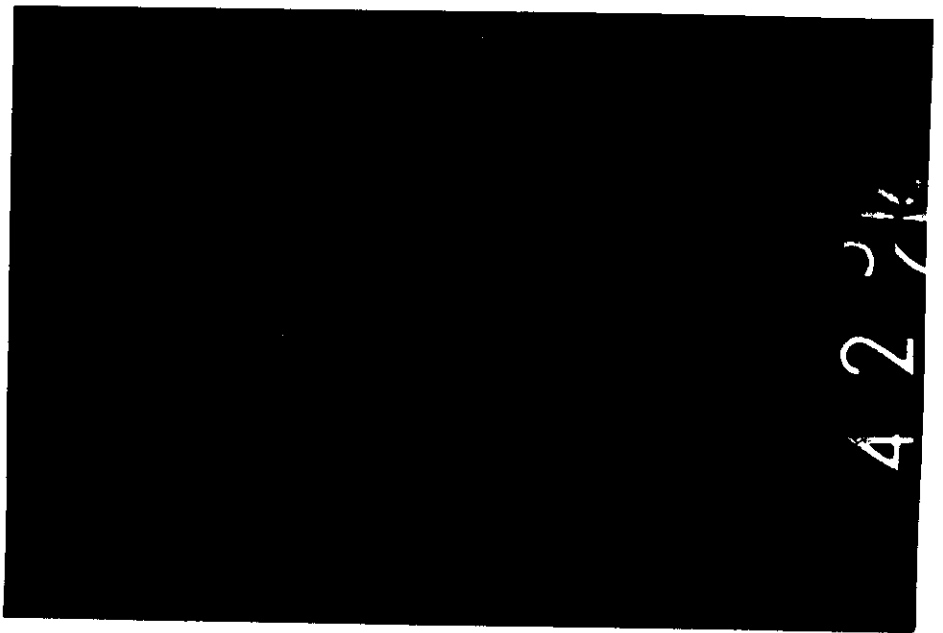
Right eye: Fluorescein angiogram, late phase.

Background diabetic retinopathy.

Background diabetic maculopathy.

Case No. (5)

Age   : 35 years.
Sex   : Male.
Visual acuity   : 6/18
Type of diabetes   : Insulin dependent
Duration of diabetes: 17 years.

Clinical diagnosis   : Fig. 4-A.

Fluorangiographic diagnosis: Fig. 4 (B,C).
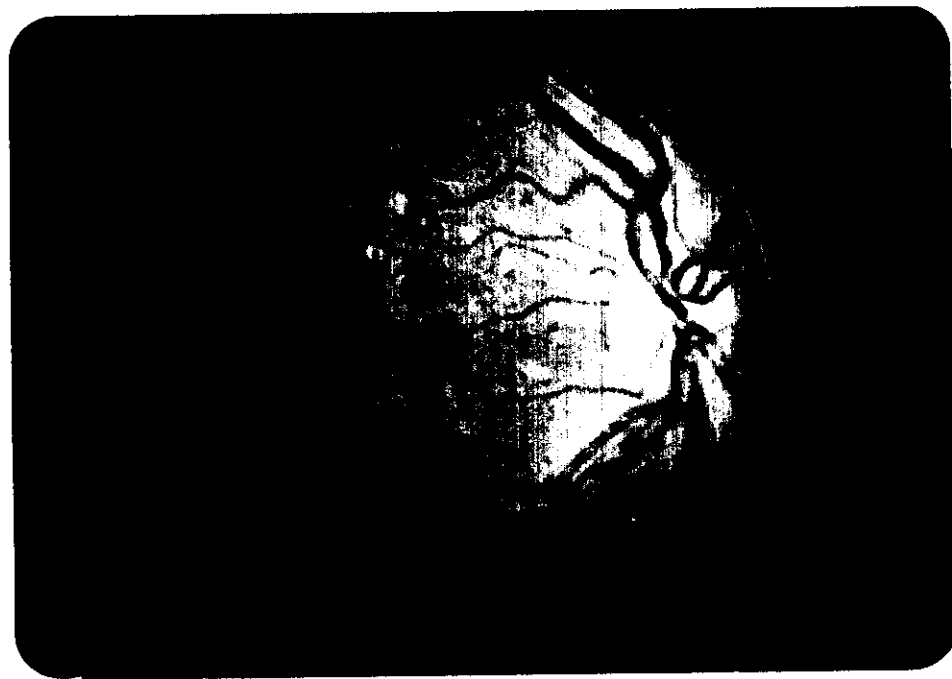

Fig. (4 A)
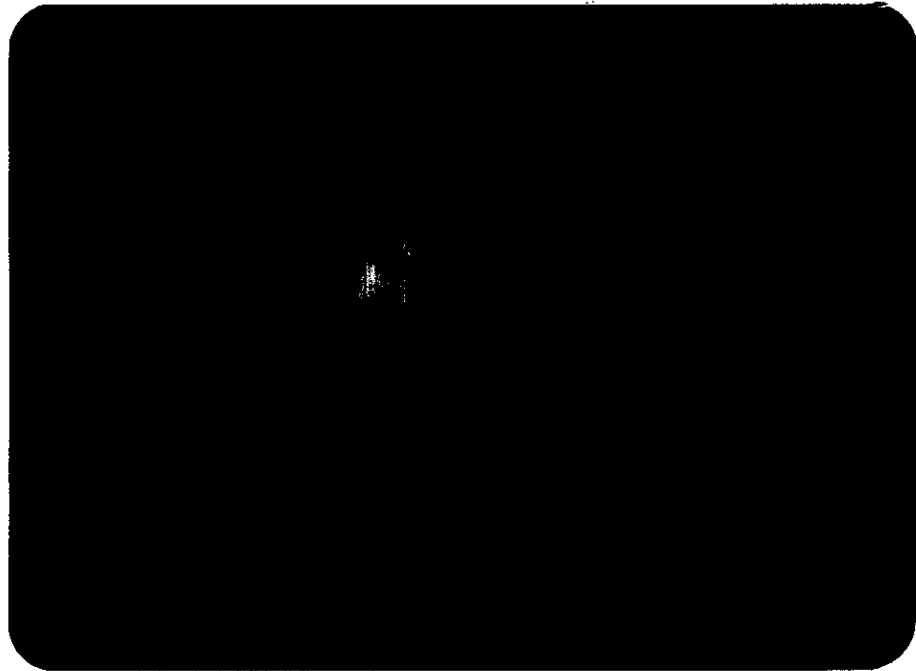
Left eye: Coloured fundus photograph.
Background diabetic retinopathy

Fig. (4-B)

Left eye: Fluorescein angiogram, arteriovenous phase.
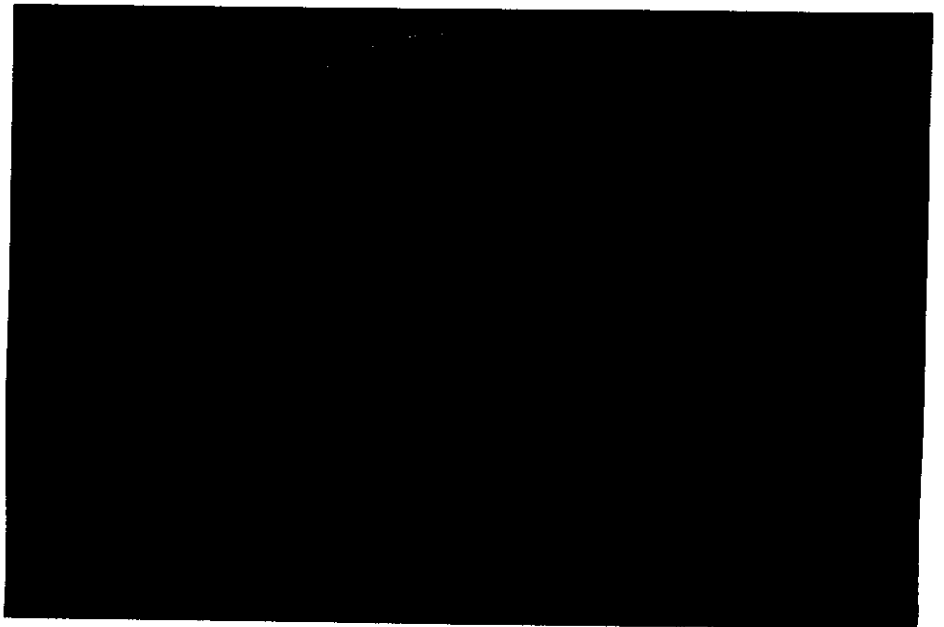
Fig. (4-C)

Left eye: Fluorescein angiogram – lat phase.

Preproliferative diabetic retinopathy

Focal maculopathy. Macular ischaemia.

Case No. (7)

Age   : 54 years.

Sex   : Male.

Visual acuity   : 6/9.

Type of diabetes : Noninsulin dependent

Duration of diabetes: 15 years.

Clinical diagnosis   :   Fig. 5-A.

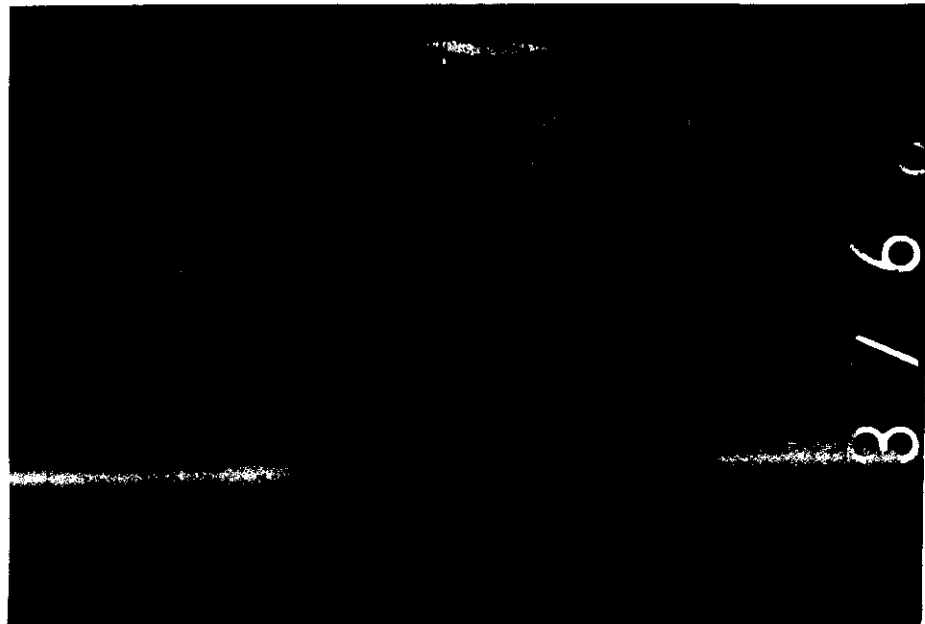Fluorangiographic diagnosis: Fig. 5 (B,C,D).

Fig. (5-A)

Right eye: Coloured fundus photograph.

Background diabetic retinopathy.

Fig. (5-B)

Right eye: Fluorescein angiogram, early phase.

Fig. (5-C)

Right eye: Fluorescein angiogram, arteriovenous phase.
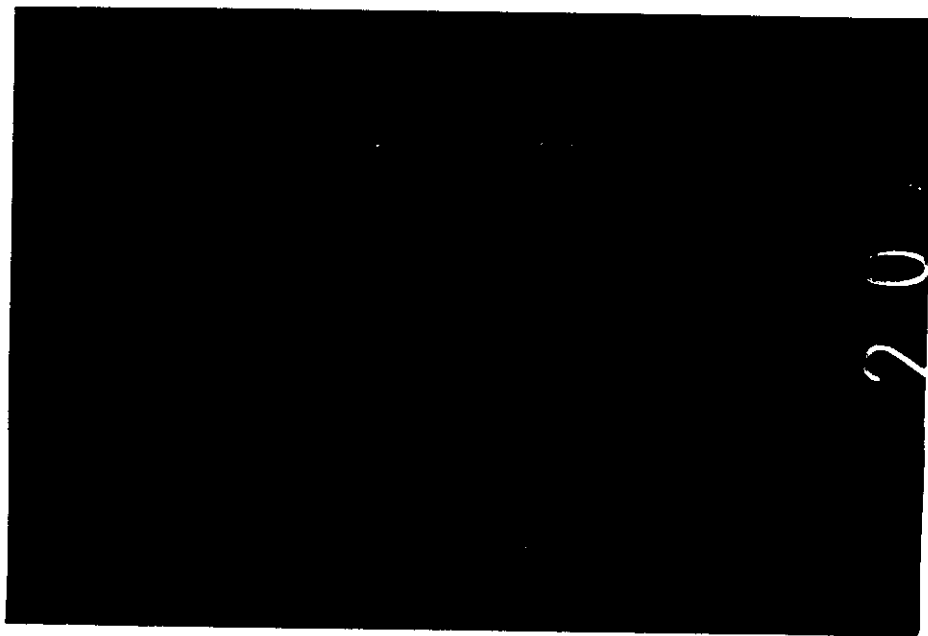
Fig. (5-D)

Right eye: Fluorescein angiogram, late phase.
Background diabetic retinopathy.
Background maculopathy.

Case No. (9)

Age   : 25 years.

Sex   : Male.

Visual acuity   : 6/9.

Type of diabetes : Insulin dependent.

Duration of diabetes: 14 years.

Clinical diagnosis   : Fig. 6-A.

Fluorangiographic diagnosis: Fig. 6 (B,C,D).

Fig. (6-A)

Right eye: Coloured fundus . Photograph (red free).
Preproliferative diabetic retinopathy, soft exudates.

Fig. (6-D)

Right eye: Fluorescein angiogram, late phase.
Preproliferative diabetic retinopathy, diffuse maculopathy.

Case No. (15)

Age   : 45 years.

Sex   : Female

Visual acuity   : 6/6.

Type of diabetes : Noninsulin dependent.

Duration of diabetes: 12 years.

Clinical diagnosis : Fig. 7-A.

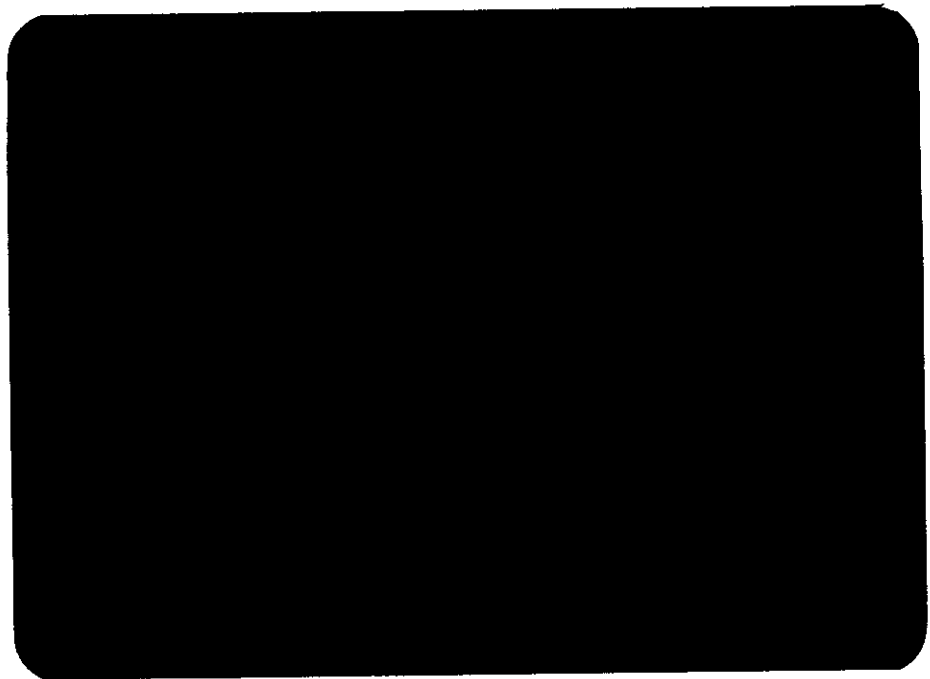
Fluorangiographic diagnosis: Fig. 7 (B,C,D).

Fig. (7-A)

Right eye: Coloured fundus photograph.

Background diabetic retinopathy, hard exudates.

Fig. (7-B)

Right eye: Fluorescein angiogram, arteriovenous phase.

(Fig. 7-C)

Right eye: Fluorescein angiogram, arteriovenous phase.

Fig. (7-D)

Right eye: Fluorescein angiogram, late phase.
Background diabetic retinopathy. Focal maculopathy.

Case No. (20)

Age   : 55 years.

Sex   : Female.

Visual acuity   : 6/9.

Type of diabetes   : Noninsulin dependent.

Duration of diabetes: 8 years.

Clinical diagnosis   : Fig. 8-A.

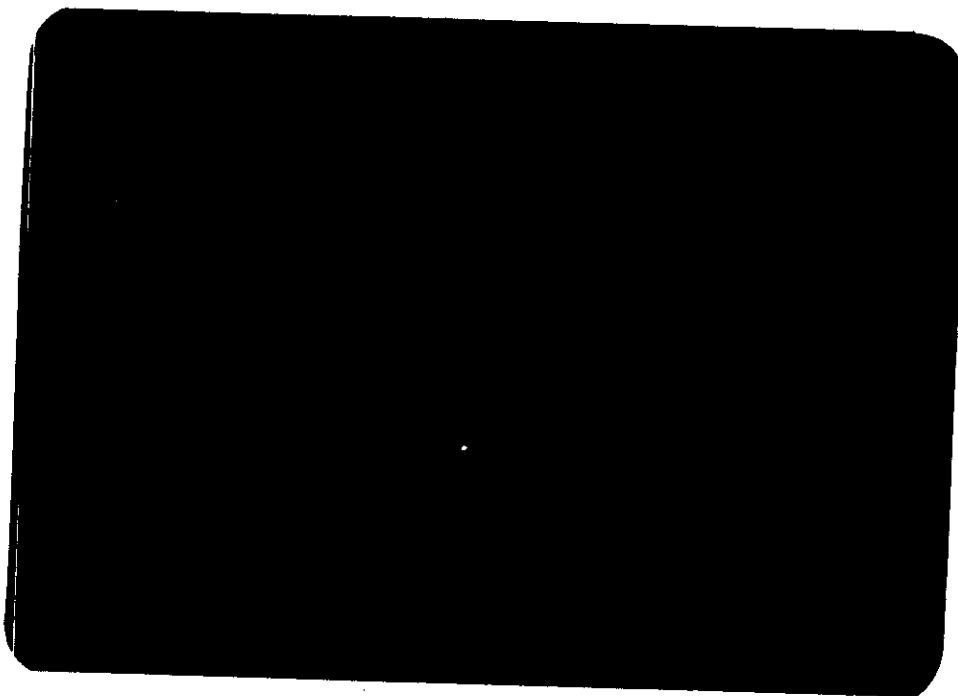Fluorangiographic diagnosis: Fig. 8 (B,C,D).

Fig. (8-A)

Left eye: Coloured fundus photograph.

Background diabetic retinopathy, circinate maculopathy.

Fig. (8-B)

Left eye: Fluorescein angiogram, early phase.

Fig. (8-C)

Left eye: Fluorescein angiogram, arteriovenous phase.

Fig. (8-D)

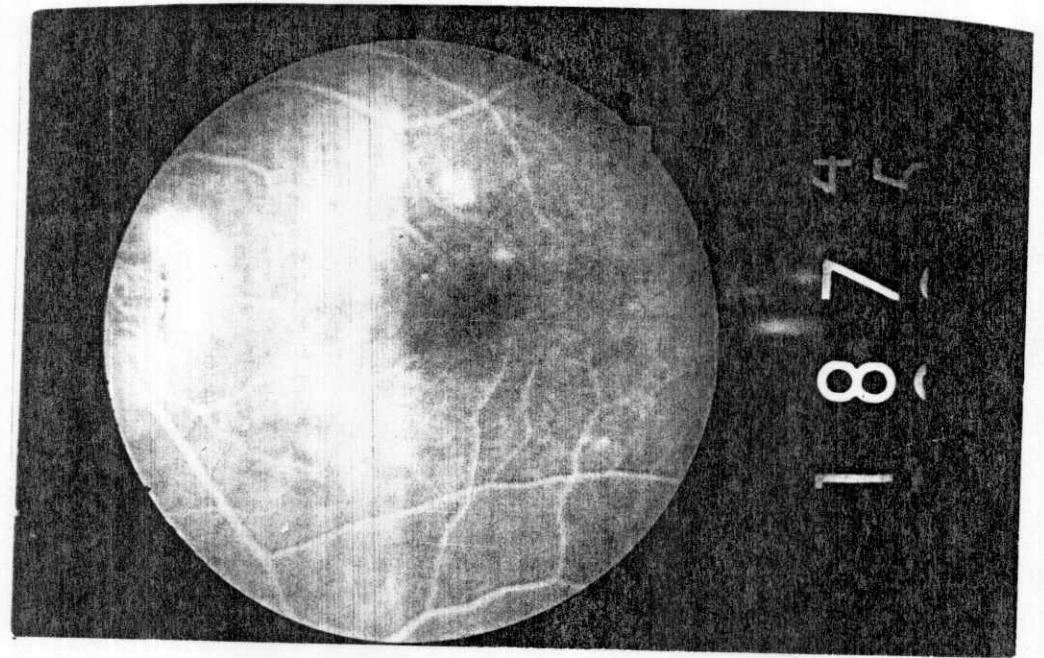*Left eye: Fluorescein angiogram, late phase.*
Background diabetic retinopathy focal maculopathy.

Case No. (21)

Age   : 56 years.

Sex   : Female.

V   acuity   : 6/36.

Type of diabetes   : Noninsulin dependent.

Duration of diabetes: 15 years.

Clinical diagnosis   : Fig. 9-A.

Fluorangiographic diagnosis: Fig. 9 (B,C).

Fig. (9-A)

Right eye: Coloured fundus photograph.

Background diabetic retinopathy, retinal ischaemia.

Case No. (25)

Age   :   50 years.

Sex   :   Male.

Visual acuity   :   6/12.

Type of diabetes   :   Noninsulin dependent.

Duration of diabetes: 16 years.

Clinical diagnosis   :   Fig. 10-A.

Fluorangiographic diagnosis: Fig. 10-B.

Fig. (10-A)

Right eye: Coloured fundus photograph.

Normal fundus.

Fig. (10-B)

Right eye: Fluorescein angiogram, late phase.
Background diabetic retinopathy.
Focal maculopathy.

Age   : 62 years.
Sex   : Female.
Visual acuity   : 6/24.
Type of diabetes   : Noninsulin dependent.
Duration of diabetes: 18 years.

Clinical diagnosis   : Fig. 11-A.

Fluorangiographic diagnosis: Fig. 11 (B,C,D).

Fig. (11-A)

Right eye: Coloured fundus photograph.
Background diabetic retinopathy.

Fig. (ll–B)

Right eye: Fluorescein angiogram, arteriovenous phase.

Fig. (ll–C)

Right eye: Fluorescein angiogram, arteriovenous phase.

Rt. eye

Fig. (ll-D)
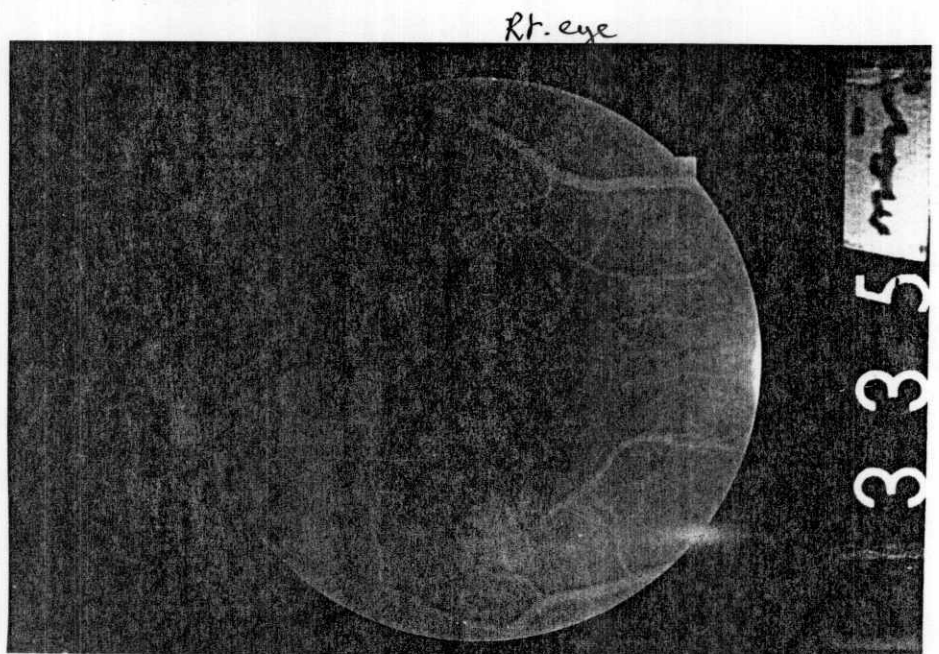
Right eye: Fluorescein angiogram, late phase.
Background diabetic retinopathy
Focal maculopathy.

-   *The case which had no clinical finding was proved angiographically to be focal macular oedema (Case No. 25).*

-   *The stages of diabetic maculopathy as diagnosed fluorangiographically were found as follow. Table V.*

    *   *Background diabetic maculopathy in 7 cases 14% (Case No. 3, 7).*

    *   *Focal macular oedema in 23 cases 46% (Case No. 5, 15, 20, 25, 31).*

    *   *Diffuse macular oedema in 13 cases 26% (Case No. 9, 21).*

    *   *Cystoid macular oedema in 7 cases 14% (Case No. 1).*

    *   *Ischaemic maculopathy in 18 cases 36% (Case No. 1, 5, 21).*

-   *The relation between the stages of diabetic maculopathy and the stages of diabetic retinopathy in the studied group was found as follow: Table VI.*

    *   *In the group of background diabetic retinopathy, the incidence of background diabetic maculopathy was 12%, focal macular oedema was 32%, diffuse macular oedema was 2%, cystoid macular oedema was 2% and ischaemic maculopathy was 16.66%.*

    *   *In the group of preproliferative diabetic retinopathy, the indicence of background diabetic maculopathy was 2%, focal macular oedema was 6%, diffuse macular oedema was 14%, cystoid macular oedema was 2% and ischaemic maculopathy was 38.88%.*

*   In the group of proliferative diabetic retinopathy, the incidence of background diabetic maculopathy was 0.00%, focal macular oedema was 8%, diffuse macular oedema was 10%, cystoid-macular oedema was 10%, and ischaemic maculopathy was 44.44%.

- The correlation between clinically detected and fluorangiographically defected diabetic maculopathy in the studied group were found as follow: Table VII.

*   Macular oedema was detected clinically in 7 cases 14%, while it was detected angiographically in 43 cases 86%.

*   Ischaemic maculopathy was found clinically in 4 cases 8%, while fluorangiographically it was detected in 18 cases 36%.

- The correlation between macular oedema and exudates in the macular area was found as follow: Table VIII.

*   In background maculopathy stage one case of soft exudates was found 14.28%, in focal macular oedema stage 8 cases of hard exudates were found 34.78%. In diffuse macular oedema stage 6 cases were found 46.15%, 2 cases of soft exudates and 4 cases of hard exudates. In cystoid macular oedema stage 6 cases of hard exudates were found 85.7%.

- The relation between type of diabetes and stage of diabetic maculopathy in the studied group were found as follow: Table IX.

*   Background maculopathy was found in 2 cases in insulin dependent group 12.5%, and in 5 cases in noninsulin dependent group 14.7%.

* *Focal macular oedema was found in 8 cases in insulin dependent group 50%, and in 15 cases in noninsulin dependent group 44%.*

* *Diffuse macular oedema was found in 4 cases of insulin dependent group 25%, and in 9 cases of noninsulin dependent group 26.47%.*

* *Cystoid macular oedema was found in 2 cases of insulin dependent group 12.5%, and in 5 cases in noninsulin dependent group 14.7%.*

* *Ischaemic maculopathy was found in 3 cases of insulin dependent group 18.75% and in 15 cases in noninsulin dependent group 44%.*

- *The relation between the duration of diabetes and stage of diabetic maculopathy in the studied group were found as follow: Table X.*

* *Background diabetic maculopathy was found in 4 cases of the first group 28.57%, in 2 cases in the second group 6% and in one case in the third group 33.33%.*

* *Focal macular oedema was found in 8 cases in the first group 57.14%. In 15 cases of the second group 45.45%, and no cases were found in the third group.*

* *Diffuse macular oedema was found in one case in the first group 7.14%. In 12 cases in the second group 36.36% and no cases were found in the third group.*

*   Cystic macular oedema were found in one case in the first group 7.14%. In 4 cases in the second group 12.12% and in 2 cases of the third group 66.66%.

*   Ischaemic maculopathy were found in 4 cases in the first group 28.57%, in 13 cases in the second group 39.39% and in one case in the third group 33.33%.

-   The relation between visual acuity and stages of diabetic maculopathy in the studied group were found as follow: Table XI.

*   Visual acuity of 6/6 was found in 2 cases in background diabetic maculopathy 20%, in 8 cases in focal macular oedema 80%, and No cases were found in the stages of diffuse, cystic and ischaemic maculopathy.

*   Visual acuity of (6/9 - 6/12) was found in 2 cases in background maculopathy stage 13.33%, in 10 cases of focal macular oedema 66.66%, in 3 cases of diffuse macular oedema 20%, in 2 cases of ischaemic maculopathy 13.33%, and no cases were found in the stage of cystoid macular oedema.

*   Visual acuity of (6/18 - 6/24) was found in 2 cases in background maculopathy stage 15.38%, in 4 cases in focal macular oedema 30.76%, in 5 cases in diffuse macular oedema 38.46%, in 2 cases of cystoid macular oedema 15.38%, and in 7 cases of ischaemic maculopathy 53.84%

*   Visual acuity of (6/36 - 6/60) was found in one case in background maculopathy stage 11.11%, in one case in focal

maculopat maculopathy 11.11%, in 4 cases in diffuse maculopathy 44.44%, in 3 cases in cystoid macular oedema 33.33%, and in 2 cases of ischaemic maculopathy 66.66%.

* *Visual acuity of less than 6/60 was found in one case in diffuse maculopathy stage 33.33%, in 2 cases in cystoid macular oedema 66.66%, in 2 cases of ischaemic maculopathy 66.66%, and no cases were found in the stage of background maculo-pathy.*

- *The relation between visual acuity and exudates in macular area in the studied group was found as follow. Table XII.*

* *The incidence of macular exudates was 10% among eyes with visual acuity (6/6), 42.85% among eyes with visual acuity between (6/9 - 6/12), 46.15% among eyes with visual acuity between (6/18 - 6/24), 60% among eyes with visual acuity between (6/36 - 6/60), while its incidence among eyes with visual acuity of less than (6/60), was 66.66%.*

There is an increasing interest in understanding the diabetic micro-vascular abnormalities in the macula in relation to the clinical and functional findings. Fluorescein angiography is a very useful method for detecting these microvascular changes, and it has been used in this study to evaluate and compare these changes in relation to clinical findings.

*As regard the classification of diabetic retinopathy, most of the reported classifications as **Sigelman, 1980** were:*

Background maculopathy, focal macular oedema, diffuse macular oedema, and cystoid macular oedema. From our observation in this study we feel that, the classification should include macular ischaemia as a separate entity since macular ischaemia can be present alone or in combination with background maculopathy or with macular oedema. This is especially important because macular ischaemia by its own can affect the vision of diabetic patients.

As regard the incidence of different stages of diabetic maculopathy, this study showed that: the stage of focal and diffuse macular oedema constitute the highest incidence of diabetic maculopathy 72%. This indicates that the majority of the examined eyes showed disturbed integrity of the perifoveal capillary bed resulting in either focal or diffuse leakage.

The stage of cystoid macular oedema constitue the lowest incidence of diabetic maculopathy 14%.

This results agrees with the result of Korra et al., 1985, who found in his series, that the incidence of focal and diffuse maculopathy was 45%, and the incidence of cystoid macular oedema was 7.5%.

As regard the relation between the stages of diabetic maculopathy and the stages of diabetic retinopathy, this study showed that: The incidence of focal macular oedema was higher (32%) in the stage of background diabetic retinopathy than in the stage of preproliferative (6%) and proliferative diabetic retinopathy (8%).

The incidence of diffuse macular oedema was higher 14% in the stage of preproliferative diabetic retinopathy than in the stage of profilerative diabetic retinopathy 10%.

This indicates that focal and diffuse macular oedema are not related to the severity of diabetic retinopathy. This means that, a patient with early stage of maculopathy may not have a concomitantly early stage of retinopathy.

The results of this study showed that the incidence of cystoid macular oedema was 2% in the stage of background diabetic retinopathy, 2% in the stage of preproliferative chabetic retinopathy and 10% in the stage of proliferative diabetic retinopathy.

This indicates that cystoid macular oedema was related to the severity of diabetic retinopathy. This means that a patient with advanced maculopathy almost always have advanced stage of retinopathy

The results of **Spalter 1971, Patz** and **Fine 1978** and **Korra 1985** showed that early maculopathy has been found with advanced proliferative retinopathy. **Korra 1985** found that the incidence of cystoid macular oedema was 2.5% with proliferative retinopathy. While its incidence with focal and diffuse macular oedema was 10% and 2.5% respectively.

As regard the relation between clinically detected and fluorangiographically detected diabetic maculopathy, this study showed that: macular oedema was detected clinically in 7 cases 14%, while fluorangiographically it was detected in 43 cases 86%. Ischaemic maculopathy was detected clinically in 4 cases 8%, while fluorangiographically it was found in 18 cases 36%. This means that fluorescein angiography was found to be a useful diagnostic method for macular oedema and ischaemia.

This result is in accordance with the results of **Cunha-Vaz et al., 1975, Aiello, 1977** and **Davis et al., 1977.** They all agree that, angiographically detected macular oedema is much more than clinically detected. **Benson et al., 1988** stated that retinal ischaemia is best diagnosed by fluorescein angiography.

The result of the present work showed that: microaneurysms has been detected angiographically much more than opthalmoscopically. (Case No. 3, 5, 9, 15).

This finding is in accordance with the results of **Scott et al., 1963** and **Gass 1968,** who reported that fluorescein angiography reveals more microaneurysms than ophthalmoscopy alone.

5 cases in this study has been diagnosed clinically as having either normal fundus (Case No. 25) or having normal macular area (Case No. 2, 3, 42, 43). Fluorangiographically the case (No. 3) proved to have a back-ground diabetic maculopathy, the rest of cases proved to have a focal maculopathy. This means that fluorescein angiography is a very useful method for early detection of diabetic maculopathy, which is important for early treatment and preservation of eye sight.

Krasanov and *Gasilina* 1973, discovered diabetic preretinopathy in 75% of cases by fluorescein angiography among ophthalmoscopically negative diabetics. Also *Milan* and *Stanic* 1990 found that the prevalence of preclinical diabetic retinopathy in 45.5% of the examined cases.

As regard the relation between the stage of maculopathy and type of diabetes, this study showed that: focal maculopathy was more common with insulin dependent diabetics 50% than with noninsulin dependent diabetics 44%. Also it was found that the incidence of cystoid macular oedema was slightly higher 14.7% with noninsulin dependent than with insulin dependent diabetics 12.5%. The incidence of ischaemic maculopathy was much higher with noninsulin dependent 44%, than with insulin dependent 18.75%, which means that, advanced stages of maculopathy were more common with noninsulin dependent diabetics than with insulin dependent diabetics, while early stages of maculopathy were more common with insulin dependent than with noninsulin dependent diabetics.

The results of **Sigelman 1981**, and **Korra et al., 1985**, agrees with the results of this work. Advanced diabetic maculopathy appears mostly in noninsulin dependent diabetics, while early stages of maculopathy appears mostly in insulin dependent diabetics.

As regard the relation between duration of diabetes and stages of diabetic maculopathy. This work show that: the incidence of cystoid macular oedema was higher 66.66% in the third group (more than 20 years), than in the second group (11 - 20 years), 12.12% and the first group (1 - 10 years), 7.14%. This means that advanced stages of maculopathy were associated with a longer duration of the disease. **Korra et al., 1985** in a similar study found the same results.

As regard the relation between visual function and stages of diabetic maculopathy, this study showed that, the prevalence of legal blindness ($>$ 6/60) was 66.66% among eyes with cystoid macular oedema and ischaemic maculopathy, while no cases of legal blindness were reported among eyes with background maculopathy and focal macular oedema. Its also evident that, normal visual acuity was highest 80% among eyes with focal macular oedema, and not found in diffuse macular oedema, cystoid macular oedema and ischaemic maculopathy. Also the prevalence of visual acuity between (6/36 - 6/60) rose from 11.11% among eyes with background maculopathy to 44.44% among eyes with diffuse macular oedema, to 33.33% among eye with cystoid macular oedema, while its incidence among eyes with ischaemic maculopathy was 77.77%.

This means that the severity of visual loss is correlated significantly with an increasing severity of maculopathy.

This result agrees with the result of **Bresnick, 1980** who found that a greater visual loss is associated with the more severe is maculopathy.

As regard the relation between visual function and ischaemia, this study showed that: the percentage of macular ischaemia rose from 0.00% among eyes with normal visual acuity (6/6) to 77.77% among eyes with visual acuity between (6/36 - 6/60). This means that there is a direct relation between severity of visual loss and mocular ischaemia.

This result agrees with result of **Tamura et al. (1976),** who found in their statistical analysis correlating the perfusion condition of the perifoveal capillary network and visual acuity that: progression in the capillary nonperfusion in the perifoveal zone is correlated with the poor visual acuity, and they concluded that although there are many factors affecting the visual acuity of diabetic patients. The condition of perfusion of the perifoveal capillary network is one of the most important factors that determine visual prognosis of these patients.

Regarding the relation between exudates in the macular area and visual function, this study showed that: the incidence of exudates rose from 10% among eyes with normal visual acuity (6/6) to 60% among eyes with visual acuity between (6/36 - 6/60), while its incidence was 66.66% among eyes of visual acuity less than (6/60). This means that: there is a direct relation between severity of visual loss and exudates in the macular area.

This result agrees with the result of **Dobree 1970,** who reported that: Although hard exudates can reabsorb over a period of months

to years, visual acuity remains poor because of permenant macular damage. Also **Cullen** and **Twen** 1975 examined 82 diabetic patients presenting with visual acuity less than 6/60 and they found that hard exudates in the central macula was thought to be the cause of visual loss in 21% of the total patients.

As regard the relation between exudates in the macular area and macular oedema, this study showed that: the incidence of exudates rose from 34.78% in cases of focal macular oedema to 46.15% in cases of diffuse macular oedema, while its incidence with cystoid macular oedema was the highest 85.71%. This means that a direct relation was found between exudates in the macular area and severity of macular oedema.

This finding is in accordance with the result of **Kohner et al.,** 1982 who reported that: the more obvious are the exudates, the more common is macular oedema. **Benson et al., 1988,** stated that, if hard exudates is seen, macular oedema is almost always present.

This work   involved the study of 50 patients with angiographi-
cally proved diabetic maculopathy. The patients were 21 males and 29
females, 16 patients were insulin dependent and 34 were noninsulin
dependent diabetics.

Detailed history and complete ophthalmic examination, as well
as fluorescein angiography were done for all patients.

The stages of diabetic retinopathy as diagnosed clinically in the
studied group were found as follow: Background diabetic retinopathy
31 cases (62%), preproliferative diabetic retinopathy 4 cases (8%) and
proliferative diabetic retinopathy 14 cases (28%). No abnormal finding
were detected clinically in one case (2%).

The stages of diabetic maculopathy as diagnosed clinically were
found as follow: macular oedema 7 cases (14%) and macular ischaemia
4 cases (8%).

The stages of diabetic retinopathy as diagnosed fluorangiographically
were found as follow: Background diabetic retinopathy 24 cases (48%),
preproliferative diabetic retinopathy 12 cases (24%) and proliferative
diabetic retinopathy 14 cases (28%).

Stages of diabetic maculopathy as diagnosed fluorangiographically
were found as follow: Background diabetic maculopathy 7 cases(14%),
focal macular oedema 23 cases (46%), diffuse macular oedema 13 cases
(26%), cystoid macular oedema 7 cases (14%).

From this study, fluorescein angiography proves to be indispensable method for the early detection of diabetic maculopathy, making possible a better disease evaluation, which is important for early treatment and preservation of eye sight.

An important outcome of this study is the fact that stages of focal and diffuse macular oedma are not related to the severity of diabetic retinopathy. This means that a patient with early maculopathy may not have a concomitantly early stage of retinopathy

The stage of cystoid macular oedema was related to the severity of diabetic retinopathy which means that: a patient with advanced maculopathy is almost always have advanced stage of retinopathy.

Advanced stages of maculopathy are more commonly seen after a long duration of the disease, and more commonly seen in noninsulin dependent diabetics. While early stages of maculopathy were more commonly found in insulin dependent diabetics.

Hard exudates can cause permenant pigment epithelial or sensory damage, so visual acuity often remains poor even after reabsorption of the exudates. Macular exudates is an indication of the presence of oedema, and a greater visual loss is associated with the presence of oedema.

Although there are many factors affecting the visual function of diabetic patients, the condition of perfusion of the perifoveal capillary network is one of the most important factors that determine the visual prognosis of diabetic patients. However visual acuity is not greatly affected in mild degrees of macular ischaemia, this is because the generous blood supply of the macula.