



## A CLINICAL STUDY OF FUNDUS CHANGES IN ICU PATIENTS

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**ABSTRACT** **Aim:** The aim of this study is to determine fundus changes & their diagnostic significance in patients admitted to ICU with various causes. **Materials & Methods:** A total of 124 patients of all age groups admitted in ICU, Government General Hospital, Kurnool, with various causes during the period of two months, November 2018 to December 2018, were included in this study. A detailed fundus examination was done in all patients after documenting the pupillary response. For all patients, a detailed history of underlying systemic diseases was taken. **Results:** Out of 124 patients in this study, the most common age group affected was 21-30 years (29%). 68 (55%) patients were males, and 56 (45%) were females. Cause for admission was Fever with altered sensorium – 48 patients (39%), Hypertension with CVA- 36 patients(29%), Diabetes mellitus – 24 patients(19%), Hypertension with Diabetes – 6 patients(5%), Snakebite – 6(5%), Organophosphorus poisoning – 4(3%). Fundus findings include: Retinal hemorrhages – 36 patients (29%), Disc hemorrhages – 12 patients(9.6%), Disc edema–22 patients(17.7%), Roth spots – 8 patients (6.4%), Vessel tortuosity -6 patients (4.8%), Hard exudates – 16 patients (12.9%), Cotton wool spots – 10 patients(8.06%), Neovascularization of disc – 2 patients (1.6%), Arteriolar attenuation & AV crossings – 22 patients (17.7%), Venous congestion – 22 patients (17.7%), Retinal edema – 14 patients (11.2%), Normal fundus – 22 patients (17.7%). **Conclusion:** Fundus changes are common in critically ill patients. The workup on the evaluation of fundus in ICU patients will be individualized depending on the presentation. They also are an eye-opener for the detection of certain systemic diseases.

**KEYWORDS :** ICU, Fundus changes, Hypertension, Diabetes

### INTRODUCTION

Many diseases are known to present with fundus involvement, such as hypertension, diabetes mellitus & diseases involving the nervous system.

The eye is the only organ in the body in which we can directly see blood vessels. The status of the blood vessels in the eye often indicates the condition of the organ state & the blood vessels throughout the body. Microvascular changes precede clinical manifestation, and so their detection should have predictive value.

Therefore fundus examination is an essential diagnostic component of any physical examination, which can assist in the diagnosis of various systemic diseases.

### MATERIALS AND METHODS

A total of 124 patients of all age groups admitted in ICU, Government General Hospital, Kurnool, with various causes during the period of two months, November 2018 to December 2018, were included in this study. A detailed fundus examination was done in all patients after documenting the pupillary response. For all patients, a detailed history of underlying systemic diseases was taken.

### OBSERVATIONS AND RESULTS

**Table 1- Age Distribution**

AGE GROUP(YEARS)	NUMBER(N)	PERCENTAGE (%)
21-30	36	29%
31-40	28	22.6%
41-50	26	21%
>50	34	27.4%
TOTAL	124	100%

Out of 124 patients in this study, the most common age group affected was 21-30 years (29%).

**Table 2- Gender Distribution**

GENDER	NUMBER(N)	PERCENTAGE (%)
MALES	68	55%

FEMALES	NUMBER(N)	PERCENTAGE (%)
FEMALES	56	45%
TOTAL	124	100%

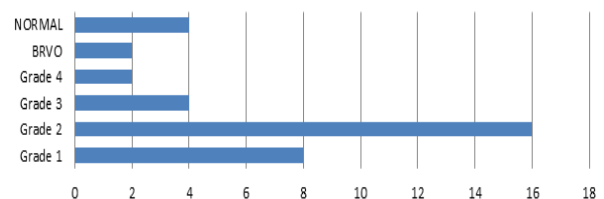
Out of 124 patients, 68 (55%) patients were males, and 56(45%) were females.

**Table 3- Cause Of Admission**

CAUSE	NUMBER(N)	PERCENTAGE (%)
Fever with altered sensorium	48	39%
Hypertension with CVA	36	29%
Diabetes mellitus	24	19%
Hypertension with Diabetes	6	5%
Snakebite	6	5%
Organophosphorus poisoning	4	3%
TOTAL	124	100%

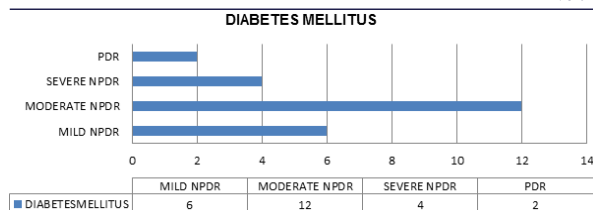
The most common cause for ICU admission in our study was fever with altered sensorium 39%. In this viral meningoencephalitis is the most common cause.

### Hypertension with CVA



**Chart 1- Hypertension With Cerebrovascular Accident(CVA)**

Out of 124 patients in this study, 36 patients had CVA with hypertension. There were 22 cases of ischemic stroke and 14 cases of haemorrhagic stroke. Among them, 8 patients had GRADE-1 hypertensive retinopathy, 16 patients had GRADE-2 hypertensive retinopathy, 4 patients had GRADE – 3 hypertensive retinopathy, 2 patients had GRADE 4 hypertensive retinopathy, 2 patients had BRVO, 4 patients had normal fundus.



**Chart 2- Diabetes Mellitus**

Out of 124 patients, 24 patients had Diabetes mellitus associated with CVA, Diabetic ketoacidosis, Hepatic encephalopathy. In these 24 patients, 6 patients had MILD NPDR changes, 12 patients had MODERATE NPDR changes, 4 patients had SEVERE NPDR, and PDR was seen in 2 patients.

#### **HYPERTENSION WITH DIABETES:**

6 patients had hypertension with diabetes. Fundus examination in these patients was grade 2 hypertensive retinopathy with moderate NPDR changes.

#### **FEVER WITH ALTERED SENSORIUM:**

Fever with altered sensorium was seen in 48 patients (39%). Most of these patients were in the age group of 21-30 years. Causes include Viral meningoencephalitis, Cerebral malaria, TB meningitis, Sepsis with Multiorgan dysfunction syndrome, Hypokalemia, Cerebral venous thrombosis. Among these, Viral meningoencephalitis is the commonest cause. Fundus changes in these patients are superficial and deep retinal hemorrhages, cotton wool spots, Roth spots, disc hemorrhages, retinal edema, and disc edema. Normal fundus was seen in 8 patients.

#### **SNAKE BITE:**

Out of 124 patients in this study, 6 patients were admitted with a snake bite. In these 6 patients, fundus examination was normal.

#### **ORGANOPHOSPHORUS POISONING:**

4 patients were admitted with organophosphorus poisoning. Fundus examination was normal in these 4 patients.

#### **FUNDUS CHANGES**

In this study, out of 124 patients, fundus changes were seen in 102 patients (82.2%). Findings include:

Retinal hemorrhages – 36 patients (29%), Disc hemorrhages – 12 patients (9.6%), Disc edema – 22 patients (17.7%), Roth spots – 8 patients (6.4%), Vessel tortuosity -6 patients (4.8%), Hard exudates – 16 patients (12.9%), Cotton wool spots – 10 patients (8.06%), Neovascularization of disc – 2 patients (1.6%), Arteriolar attenuation & AV crossings – 22 patients (17.7%), Venous congestion – 22 patients (17.7%), Retinal edema – 14 patients (11.2%), Normal fundus – 22 patients (17.7%)

#### **SUMMARY**

The current study showed that the most commonly affected age group was in between 21-30 years (29%). Males were commonly affected (55%). In the case of fever with altered sensorium (39%), viral meningoencephalitis is the most common cause. Hypertension with CVA was seen in 36 patients (29%); most of them had grade 2 hypertensive retinopathy changes. Diabetes was seen in 24 patients (19%) with moderate NPDR was the most common finding. Snakebite was seen in 6 patients, and Organophosphorus poisoning in 4 patients with normal fundus.

#### **CONCLUSION**

Fundus changes are common in critically ill patients. The retinal vasculature changes may be the reflections of the changes in the vascular status of other organs of the body, especially the cardiovascular system, the central nervous system, and the renal systems. The control of hypertension is most important to prevent visual impairment or visual loss and also morbidity and mortality of the patient.

Early identification of diabetes mellitus at mild and moderate NPDR stage will prevent further progression to PDR. Diabetic retinopathy is microangiopathy, so its early identification will help in preventing life-threatening complications such as Diabetic nephropathy & Diabetic

neuropathy. Lesions such as Retinal hemorrhages, cotton wool spots, and Roth spots were predominantly seen in infectious causes.

The workup on the evaluation of fundus in ICU patients will be individualized depending on the presentation. They also are an eye-opener for the detection of certain systemic diseases.

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