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RESEARCHARTICLE

STUDY OF OPHTHALMIC MANIFESTATIONS IN PATIENTS WITH HAEMATOLOGICAL DYSCRASIAS

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Abstract

BackgroundAndObjectives:Haematologicaldyscrasiasreferstodisorders of the cellular elements of the blood, indicating a pathologicalcondition.Tostudythetypesofophthalmicmanifestationsinhaematological dyscrasias.

Methods: This was a Descriptive cross-sectional study of 200cases admitted and diagnosed with various haematological dyscrasias inMedicine, Paediatrics wardsof the hospital betweenDecember 2020 toNovember2022.Allpatientsunderwentastandardisedandcomprehensive ophthalmic evaluation.

Results: Outof200cases,152caseswereofnonmalignantdiseases,and 48 cases were of malignant diseases.Male cases were predominantly higherthan female cases. Conjunctival pallor was the most common anteriorsegment manifestation observed, and Retinal haemorrhage was the mostcommon posterior segmentmanifestation observedduring the studyperiod.

Conclusion: It is essential to examine all patients with haematologicaldisordersforocularmanifestationsasithelpsindiagnosisand prognosis. Early recognition of the ocular manifestations is of greatimportance as an early treatment institution may prevent or alleviatebothocularandsystemic complications.

Introduction:-

According to the historical medical literature, the word dyscrasia, which in Greek means "poor temper", was used torefer to sickness. Now, the term "blood dyscrasia" describes the problems of the biological constituents of blood,which point to a pathological situation[1].Polycythemia(increased RBCs) or anaemia are terms for variations in apatient's overall red blood cell count (decreased RBCs). An increase in the population of abnormal or neoplastic whiteblood cells in the blood implies leukemia[2].A decrease in platelet count in the blood, called thrombocytopenia ordefectiveplateletfunction,canleadtobleedingdisordersorcoagulopathies.Therearevariousophthalmicmanifestationsseeninhaematologicaldyscrasias,includinganteriorsegmentfindingsandposteriorsegmentfindings. Anterior segment findings include conjunctival pallor, and subconjunctivalhaemorrhage. Posterior segmentfindingsincludehaemorrhagesand exudates,cotton woolspots,vascularsheathingand tortuosityetc.

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These blood conditions frequently coexist. The columns of venous and arterial blood in the fundus of the eye areexposed, allowing for observation or imaging with an adequate magnification ophthalmoscope. The eye doctor isfrequently the initial observer. Before the patient sees a haematologist, whose examination provides the definitivediagnosis, its disorders may manifest in a diversity of locations[3]. The typical ophthalmoscopic findings can be seenin a variety of eye disorders and are not pathognomonic of blood dyscrasias (i.e., diabetes, hypertension, collagenvascular disease). However, blood dyscrasia has a distinct pattern and distribution of retinal outcomes. Furtherexaminations may indicate a blood dyscrasia if these distinctive ophthalmoscopy characteristics are seen, enablingthe doctor to recommend the patient for therapy as soon as possible[4] . Our research intends to track the occurrenceof blood dyscrasias, ocular symptoms, ocular signs, their diagnostic and prognostic value of thecondition, andwhether or not they improve or worsen with treatment.The eye is a beautiful organ, and it is the only place in thehumanbodywherea doctorcanseeapartofthecentralnervoussystem,theopticnerveandanyotherchangesinthe bodythroughthe retinabeforewecanvisualisesymptomsandsignsinthebody. Thuseyeexaminationisimportant.

MaterialAnd Methods:-

Study Design The present study was a Descriptive cross-sectional study done on 200 cases. It wascarried out ata tertiary care hospital in western Maharashtra in a rural setup from December 2020 to November 2022.Twohundredcasesadmittedanddiagnosedwithvarioushaematologicaldisorderswerestudiedforocularmanifestations related to it. All the cases were examined for ocular manifestations in the respective wards where thepatients were admitted.

InclusionCriteria

1. Alldiagnosedcasesof Haematologicaldyscrasias.
2. Patientswith agegroupsabovefiveyearsofeithergender.
3. Those willingtogive writteninformedconsenttoparticipateinthe study.

Exclusioncriteria

1. Patientswithassociatedsystemicdiseasessuchasdiabetes,hypertension etc.whichcanleadtoretinopathy.
2. Patientswithocular trauma.

Data Collection

Data will be collected from all the selected patients using a structured proforma meeting the objectives of the studyby means of a detailed personal interview with the patients about their symptoms and medical history after informedconsent.Patients fulfillingtheinclusioncriteriawillbeincluded inthestudy.Ocular evaluationincludes:

1. Recordingbestcorrectedvisualacuityusing Snellen'schart.
2. Anteriorsegmentexaminationusinga Slitlamp.
3. Intraocularpressuremeasurementwith the help ofa schiotztonometer.
4. FieldchartingwithHumphreyperimeter.
5. Dilatedfundusexaminationbymeansofthe directophthalmoscopeand indirectophthalmoscope.
6. Fundusphotographswith the help ofa funduscamera.

The patients also underwent relevant haematological investigations to find out the type of haematological disordersand theircorrelationwiththe clinical picture.

Datawillbeanalysedbyapplyingappropriatestatisticaltests.

EthicalIssues

The study was conducted following the Helsinki declaration and after it was approved by the Institutional EthicalCommittee and Research Cell of the Institute. A written informed consent was taken from all the patients, and only thosewho consentedwere studied.

Results:-

Two hundred cases of haematologicaldyscrasias were examined in the study. Out of 200, 111 were male, and 89 werefemale. Most cases of ocular manifestation with haematological dyscrasias were seen between the ages of 31 and 40years.Meanage35.59±16.77ageswereobserved.Malecaseswerepredominantlyhigherthanfemalecases,atan

M.F ratio of 1.25:1. In 200 cases, 24% of cases were observed with a malignant disorder and 76% with a non-malignant disorder. Iron deficiency anaemia was the most common type of anaemia seen in 42% of cases from nonmalignant disorders.Non Hodgkin lymphoma was the most common type of malignant disorders, seen in 12% of cases.66%of cases were presented with defective vision, followed by 3% each withFileddefectsandDiplopia,respectively. Retinal haemorrhage (61%) was the most common manifestation observed during the study period.Nodeaths or complications were observed at the time of discharge or follow up. Out of 200 cases, visual acuity innonmalignantcases(between 6/6-6/18 constitutes 93.95%) was better than in malignant cases(between 6/6-6/18 constitutes74.5%)asinmalignantcases; there is more involvementofposterior segment.

Table 1:- Agewisedistributionofcases.

Agewisedistributioncases	**Nonmalignantcases**	**Malignantcases**	**Total no ofcases(%)**
5–20	25	5	30(15%)
21–30	33	15	48(24%)
31–40	46	16	62(31%)
41–50	11	8	19(9.5%)
51–60	12	8	20(10%)
61–70	7	10	17(8.5%)
71–80	1	2	3(1.5%)
>80	1	-	1(0.5%)
Gender			
Male		111	55.5
Female		89	44.5

Meanage35.59±16.77,M.Fratio– 1.25:1

Table 2:- Malignantandnonmalignantdisorders.

Malignant / Nonmalignant	**No ofcases**	**Percentage(%)**
Nonmalignantdisorder	149	74.5
Malignantdisorder	51	25.5

Table 3:- Incidenceofvarioustypesofhaematologicaldyscrasias.

NonMalignantcases	**No ofcases**	**Percentage(%)**
IDA	84	42
APLASTICANEMIA	21	10.5
MA	13	6.5
HA	11	5.5
TP	8	4
ANEMIAOFCHRONICDISEASE	7	3.5
THAL	5	2.5
Malignantcases	**No ofcases**	**Percentage(%)**
NHL	24	12
CLL	6	3
AML	5	2.5
CML	5	2.5
HL	4	2
MM	4	2
ALL	3	1.5
Total	**200**	**100**

Table 4:- Symptoms&Ocularmanifestations.

Symptoms	**No ofcases**	**Percentage(%)**
DefectiveVision	132	66

Fielddefects	6	3
Diplopia	4	3
OcularManifestation		
Retinalhaemorrhage	122	61
Preretinalhaemorrhage	85	42.5
Cottonwoolspot	81	40.5
Hagewithwhitecentre	14	7
Proptosis	6	3
Vascularocclusion	3	1.5
Vasculartortuosity	3	1.5
Vitreoushaemorrhage	2	1
Papilledema	1	0.5
Cranialnervepalsy	1	0.5

Table 5:- Distributionofcasesaccordingtovisualacuityinthe affected eye.

Visualacuity inthe worsteye	**No.ofcasesinNon-Malignantconditions**	**No of cases in Malignantconditions**
6/6-6/9	104**(69.79%)**	32(62.74%)
6/12-6/18	36(24.16%)	6(11.76%)
6/24–FC3m	9 (6.04%)	11**(21.56%)**
FC3m–PL	-	2 (3.92%)
total	149	51

Discussion:-

Haematological diseases enclose a wide spectrum of disorders ranging from benign to malignant conditions that canpresent with ocular involvement. The ocular manifestations are mostly asymptomatic. Most common manifestationsencompassconjunctivalpallor,retinalhaemorrhagesandcottonwoolspots.Anaemiasarethemostcommonhaematological disorders in India. Iron deficiency anaemia is the most common type of anaemia. The literature hasseveral studies and case reports illustrating the ocular symptoms of various blood dyscrasias. Two hundred patientswith various blood dyscrasias were investigated for the current study, with 44.5% female and 55.5% male patients atPravaral Rural Hospital, Loni. The study's participants ranged in age from 5 to 85, with 32 patients under the age of20 and 168 patients in the adult group. Leukemia, multiple myeloma, lymphoma, and a variety of anaemias wereamong the blood abnormalities that were studied in the patients. A thorough eye examination was performed, andbloodcountswererecorded.Inourinvestigation,200individualswithvariousanaemiasdisplayedvisualabnormalities. Retinal haemorrhage (61%) was the most common manifestation observed during the study period,followed by Pre retinal haemorrhage (42.5%), Cotton wool spot (40.5%) hagewith white centre (7%), Proptosis(3%), Vascular occlusion (1.5%), Vascular tortuosity (1.5%), Vitreous haemorrhage (1%) and Papilledema andcranial nerve plasty (0.5%) respectively. In their investigation, Holt and Gordon-Smith[5] did not detect any retinalhaemorrhage in patients whose only peripheral blood abnormality was thrombocytopenia. However, Katariaet al.[6]analysed two cases of thrombocytopenic purpura and discovered retinal haemorrhage in one of them when theystudied the fundus. In their analysis of 123 haemophilia patients, Rubenstein and colleagues [7] found that 25 of theindividuals had ocular abnormalities, the majority of which were orbital or periorbital haemorrhages. In our study, atotal of 51 (25.5%) patients were diagnosed with haematological malignancies; out of two hundred, 42% cases hadIDA, 12% cases had NHL, 10.5% cases had aplastic anaemia, 6.5% cases with MA, 5.5% cases had HA, 4% caseswere TP, 3.5% cases of anaemia of chronic disease, 3% cases of CLL, 2.5% each case of AML, CML and THAL,2%eachcaseofHLandMM,and1.5%caseswerediagnosedwithALL.Inpatientswithhaematologicalmalignancies in different studies Investigator Incidence Allen and Straatsma[8] (1961) 38 of 76 (50%) Robb, Ervin et al. [9](1979)30-44of60(50-73%)KincaidandGreen[10](1983)284of357(50%)Nelsonet al. [11](1983)33of117 (28%) Schachatet al. [12] (1989) 51 of 120 (42%) Leonardyet al. [13] (1990) 42 of 135 (31%) The fact that the bulk ofthese studies were pathological, whereas ours was clinical research might account for the significant difference in theprevalence of ocular involvement in those studies. Three individuals with vitreous haemorrhage were reported bySchachat and colleagues[12], all of whom had myeloid leukaemia. In 9 individuals, the involvement of the optic nerveand optic disc was evident as papilloedema, nerve infiltration (associated with bilateral proptosis), and pallor of theoptic disc. Two of the five papilloedema patients had AML, one had ALL, and one had CML. Out of 33 cases ofacuteleukaemia,HoltandGordon-Smith[5]detectedpapilloedemainjustonecase.AccordingtoKincaidand

Green[10], acute leukaemia (43 out of 233 eyes) is slightly more likely than chronic leukaemia to impact the opticnerve in some way (15 out of 97 eyes). 61% of patients had retinopathy overall. The difference in mean totalleukocytic count (TLC) between acute leukaemia patients with retinopathy and those without retinopathy was notfoundtobestatisticallysignificant;
however,foranaemicpatients,thedifferencewasstatisticallysignificant(p=0.0019).However,itischallengingtoexplainhowlow countscontributetoretinopathy.Inthosewithretinopathyinleukaemia,theplateletcountandhaemoglobinconcentrationwerelowe r,suggestingthatthedifference in their means was statistically significant (p=0.009 for platelets and p=0.005 for haemoglobin). Thiscould mean that individuals with acute leukaemia who have a lower platelet count and haemoglobin concentrationhave a higher risk of acquiring retinopathy. The statistical analysis also showed that patients with anaemia andretinopathy had significantly lower mean platelet counts and haemoglobin concentrations than patients withoutretinopathy(p=0.001for plateletcountandp=0.003 for haemoglobin).

Conclusion:-

Whileirondeficiencyanaemiawasmorecommoninwomen,haematologicaldyscrasiashowedamalepredominance with most diseases. The ability of these haematological disorders to develop ocular involvement, aswell as significant clinical signs that may be seen with each,is highlighted by a number of examples. The presenceof posterior segment lesions in leukemia patients served as a notable illustration of this. Moreover, our researchintends to track the occurrence of blood dyscrasias, ocular symptoms, ocular signs, their diagnostic and prognosticvalue of the condition, and whether or not they improve or worsen with treatment.Prompt diagnosis and treatment aredecisiveinthemanagementof these disorders.

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