**COMPREHENSIVE STUDY ON DENGUE INFECTION AND CO-INFECTION OF MALARIA IN 2021 AT Dr LAL PATH LABS (J&K)**

**MARIYA,1 BALWINDER KAUR 2, AABID AHMAD KHANDAY 3**

1. PG student at Desh Bhagat University Mandi Gobindgarh, Punjab.
2. Assistant professor at Desh Bhagat University Mandi Gobindgarh, Punjab.
3. Teaching Assistant, at Desh Bhagat University Mandi Gobindgarh, Punjab.

**ABSTRACT**

Blood is made up of both plasma and cells. It is a specialized biological fluid that transports waste away from those cells and supplies them with necessary nutrients and substances including sugar, oxygen, and hormones. This waste is finally drained out of the body through sweat and lung (carbon dioxide).Blood also contains clotting agents.[1] "Blood is a type of connective tissue and is made up of two primary parts:Plasma,which is a clear extracellular fluid and Formed elements, which are composed of blood cells (RBC, WBC, platelets), are formed.

In humans and other vertebrates, plasma makes up 55% of the blood fluid[1], is 92% water by volume[2], and contains dispersed proteins, carbohydrates, minerals, hormones, and carbon dioxide.

**INTRODUCTION**

Dengue fever is a disease caused by mosquitoes infected by the dengue virus and is prevalent in the tropical regions of the world .It is painful ,disabling disease ,with the severity of pain similar to that of bones breaking-hence it is also known as‘Breakbone’fever.

Dengue fever affects close to 400 million people worldwide each year ,with about 40% of the world’s population being at risk of exposure and infection. Since dengue fever is caused by a virus, it cannot be cured by antibiotics.

The major symptoms of dengue fever include sudden high fever(as high as 40 °C or104 °F), chills, severe headache (usually behind the eyes), muscle ache and joint pain,nausea,vomiting,flushed skin and in some cases, a skin rash similar to measles. Dengue fever symptoms may be mild initially and mistaken for a flu, cold or a viral infection.In rare cases, dengue fever may develop into a more life threatening form known asdengue hemorrhagic fever, which results in bleeding, decreased blood platelet countor thrombocytopenia, blood plasma leakage or the more fatal dengue shock syndrome, which causes dangerously low blood pressure.[31]

blood, fluid pumped by the heart that circulates throughout the body via the arteries,veins, and capillaries (see circulatory system ; heart ). An adult male of average size normally has about 6 quarts (5.6liters) of blood. The blood carries oxygen and nutrients to the body tissues and removes carbon dioxide and other wastes. The color less fluid of the blood, or plasma, carries the red and white blood cells, platelets, waste products, and various other cells and substances.[13]

The blood consists of a suspension of special cells in a liquid called plasma. In an adult man, the blood is about 1/12th of the body weight and this corresponds to 5-6 liters.Blood consists of 55 % plasma, and 45 % by cells called formed elements. The bloodperforms a lot of important functions. By means of the hemoglobin contained in theerythrocytes, it carries oxygen to thetissues and collects the carbon dioxide (CO2). Italso conveys nutritive substances (e.g. amino acids, sugars, mineral salts) and gathersthe excreted material which will be eliminated through the renal filter. The blood also carries hormones, enzymes and vitamins. It performs the defense of the organism by mean of the phagocitic activity of the leukocytes, the bactericidal power of the serum and the immune response of which the lymphocytes are the protagonists.

The erythrocytes are the most numerous blood cells i.e. about 4-6 millions/mm3. Theyare also called red cells. In man and in all mammals, erythrocytes are devoid of anucleus and have the shape of a biconcave lens. In the other vertebrates (e.g. fishes, amphibians, reptilians and birds),theyhave a nucleus.The red cells are rich in hemoglobin, a protein able to bind in a faint manner to oxygen. Hence, these cells areresponsibleforprovidingoxygentotissuesandpartlyforrecoveringcarbondioxideproduced as waste. However, most CO2 is carried by plasma, in the form of solublecarbonates.

Leukocytes, or white cells, are responsible for the defense of the organism. In theblood, they are much less numerous than red cells. The density of the leukocytes in the blood is 5000-7000 /mm3. Leukocytes divide in two categories: granulocytes andlymphoid cells or agranulocytes. The term granulocyte is due to the presence ofgranules in the cytoplasm of these cells. In the different types of granulocytes, thegranules are different and help us to distinguish them. In fact, these granules have adifferent affinity towards neutral, acid or basic stains and give the cytoplasm different colors. So,granulocytes distinguish themselves in neutrophil, eosinophil (oracidophil)and basophil. The lymphoid cells, instead, distinguish themselves in lymphocytes and monocytes.Aswe will see later, even the shape of the nucleus helps us in there cognition of the leukocytes. The main function of platelets, or thrombocytes, is to stop the loss of bloodfrom wounds(hematostasis). To this purpose, they aggregate and release factors which promote the blood coagulation. Among them, there are these roton in which reduces the diameter of lesioned vessels and slows down the hematic flux, the fibrin which trap cells and forms the clotting. Even if platelet appears round ishin shape,they are no trealcells.In the smearsstained by Giemsa,they have an intensepurple color.



Dengue fever is endemic in tropical and subtropical areas. Dengue fever is estimated by the World Health Organization(WHO) to cause about 50-100 million infections per year worldwide.The U.S.Centers for Disease Controland Prevention(CDC) considers dengue fever to cause the majority of acute febrileillnesses in travelers returning to the

U.S. The first clinical report of dengue fever was in 1789 by B. Rush, although theChinesemayhavedescribedthediseaseassociatedwith"flyinginsects"asearlyas420AD. Africans described "kadingapepo" as cramp-like seizure caused by an evil spirit.The Spanish may have changed "dinga" to dengue since it means fastidious or carefulinSpanish,whichdescribesthegaitofpeopletryingtoreducethepainofwalking.Unfortunately,the disease incidence seemstobe increasing.Researcherssuggest the surge in dengue fever may be due toseveral factors:Increased urbancrowdingwithmoresitesformosquitoestodevelopInternationalcommercethatcontains infected mosquitoes, thus introducing the disease to areas previously free ofthediseaseLocalandworldenvironmentalchangesthatallowmosquitoestosurvivethewinter monthsInternational travelers who carry the disease to areas where mosquitoeshavenotbeen previouslyinfected

**MATERIAL AND METHODS.**

Study Area:J&K

OurstudywasconductedatDR.LALPATH LABSwhichprovidesthehealthcareservicestothelocalpeopleandservesasareferralcentertotheentirestate.ThefacilityprovidesavarietyofhealthcareservicesthroughinpatientandoutpatientdepartmentsundertheunitsofMedicine,Gynecologyandothersubspecialties(e.g.Surgery,Pediatrics,PathologyandRadiology).Theclimateofthedistrictisgenerallytemperateitvariesgreatlyfromtropicaltoservecolddependinguponthealtitudeofthearea.ThetemperaturedropsbelowfreezingpointnotonlyathighaltitudeevenatplaceslikeDehradunduringthewinters,theareareceivesanaverageannualrainfallof2073.3mm.MostisreceivedduringthemonthsfromJunetoSeptember,JulyandAugustbeingrainiest.ThepresentstudywasconductedbetweenAugust2021toNovember2022.Patientsbelongedtodifferentterrainsandcommunities(e.g.thickforest,heavyrainfall,slowrunninghillstreams,forestbusties,andlowsocioeconomiccommunities).Someareaisextensivelycanalirrigatedandthevillagesaresurroundedbyanetworkofirrigationcanal,distributariesdrainagesystem.Waterloggingandseepagefromcanalhascreatedidealmosquitobreedingsourcesinsomeareaagricultureindependentontubewellsandormonsoon.

Datacollection: Totalcaseswere125anddataiscollectedfromDR. LAL PATH LABSwhereapassivesurveillancewasconducted(passiveistheroutinenotificationofdiseasebyhealthdepartmentbasedonthestandardizedreportingforms)andcausesofdiseasearedetected.WeusedthosedenguecaseswhichwereconfirmedbyserologicaltestswithDenguecombitest(NS1,IgG,&IgM).Ifanysingleparameteri.eNS1,IgG,IgMantibodyshowedpositivity,theninthatcondition.

**MicroscopicStudy**

But we confirmed all blood samples by microscopy done our doctors. Microscopicstudyismustforanyinvestigationandcellcount.(e.g.TLC,DLC,Plateletcount)formicroscopicstudyusedaspecialstainLeishma-stain.Leishmanstainis one of the best to give blood cell morphology picture when stained. The staincontainsmethyleneblueandeosininmethanolintheratioof1.5/1litre.

**RESULTS**

The present study was carried out at the DR. LAL PATH LABS from May 2021 toOctober 2022 The present study is a prospective, self administered study to determineabout the Dengue infection in 2021 in Srinagar region. A total of 155 patient wereincludedinthestudyandallrelevanttestinvestigationsweredoneandtheresultswerecollectedforouranalysisofDengueinfectionandalsotoseetheco-infectionofMalariainDengueinfection.

TOTALCASEANALYSED:155

CaseDistributionAccordingtoNegativeandPositiveDengueMalariaInfection:

|  |  |  |
| --- | --- | --- |
| **CaseDistribution** | **NoofPatient** | **Percentage** |
| **DENGUEPOSITIVE** | **119** | **76.7** |
| **MALARIA POSITIVE** | **6** | **3.8** |
| **NEGATIVE** | **30** | **19.3** |

90

80

70

60

50

40

30

20

10

0

denguepositive

malariapositive

negative

 **FIG:5.CASEDISTRIBUTION**

**The study was carried total 155 patient, All patient presented high grade fever.Ourstudy based on dengue positive and co-infection of malaria. 119 patients are denguepositiveand6aremalariapositiveand30patientshavefeverbutnomalariaanddengueinfection.ourstudy based on positivecases.**

DistributionofPatientAccordingToSex:

Atotalof125patients wereobservedinthisstudy

|  |  |  |
| --- | --- | --- |
| SEX | NOOFPATIENT | PERCENTAGE |
| MALE | 76 | 60.8% |
| FEMALE | 49 | 39.2% |

**female**

**male**

 Figure: male and female distribution

Out of 125 patients,76(60.8%)were male patient and 49(39.2%)female patient.All patients presented with high grade fever and Weakness,

DistributionofPatientAccordingtoAge:

|  |  |  |
| --- | --- | --- |
| AGEGROUP | NOOFPATIENT | PERCENTAGE |
| 1-10 YEARS | 4 | 3.2% |
| 11-20YEARS | 13 | 10.4% |
| 21-30YEARS | 27 | 21.6% |
| 31-40YEARS | 13 | 10.4% |
| 41-50YEARS | 21 | 16.8% |
| 51-60YEARS | 23 | 18.4% |
| 61-70YEARS | 10 | 8% |
| 71-80YEARS | 9 | 7.2% |
| 81-90YEARS | 5 | 4% |
| TOTAL | 125 | 100% |

##  CaseDistributionAccordingToPositiveInfection:

|  |  |  |
| --- | --- | --- |
| **CaseDistribution** | **NoofPatient** | **Percentage** |
| DENGUEPOSITIVE | 119 | 76.7 |
| MALARIA POSITIVE |  6 | 3.8 |
| NEGATIVE | 30 | 19.3 |

Majority cases are dengue positive from 155 cases. We collected data of 155 patients,129 are dengue positive and 6 are malaria positive and other have no infection of dengue and malaria. So we take 125 positive infection cases for further study.

**DISCUSSION.** The present study was carried on 125 patients, where the age wise distribution of Dengue cases was seen. Most cases occur in 21-30 years of age group. 1-10 years of age group patient admit in pediatrics ward n other are admit in medicine ward. In this study only 4 (3.2%) patient in 1-10 years of age group, 10.4% in11-20 years of age group, 21.6% in 21-30 years of age group, 10.4% in 31-40 years of age group, 16.8%in 41-50 years of age group, 18.4% in 51-60 years of age group, 8% in 61-70 years ofagegroup,7.2%71-80yearsofagegroup.Maximumpatientin21-30yearsofagegroupand our study compare to other study all study show that maximum patient in 31-40years of age group

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