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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/19501
DOI URL: http://dx.doi.org/10.21474/IJAR01/19501

RESEARCH ARTICLE

ROLE OF PLEURAL FLUID C- REACTIVE PROTEIN CONCENTRATION IN DIFFERENTIATING EXUDATIVE FROM TRANSUDATIVE EFFUSIONS AMONG ADULT POPULATION

Dr. Madhu Kaushal[1], Dr. Palisetti Vamsi Krishna[2], Dr. Bimal Kumar Singh[3] and Dr. Sunil Nagar[4]

1. MBBS, M.D (Medicine) ACHD (Physician) Northern Railway Central Hospital (NRCH), New Delhi.
2. DNB Medicine Department of General Medicine Lady Harding Medical College, New Delhi.
3. MBBS (Hons) MD Medicine, Chief Physician Head of Department NRCH, New Delhi.
4. Senior Consultant and Head of Department of Pulmonary Medicine, Accord Hospital, Fardidabad.

Manuscript Info

Manuscript History
Received: 18 July 2024
Final Accepted: 20 August 2024
Published: September 2024

Abstract

Introduction:-

TheestimatedprevalenceofPleuraleffusionis320casesper100000population.InIndiaitismore than 1 million cases per year.

Developmentofpleuraleffusionhasvariedetiologicalfactors,oftenpresentingadiagnosticproblem evenafterextensiveinvestigations.

Thecornerstoneintheetiologicaldiagnosisofpleuraleffusionisclassificationintotransudativeand exudative effusions.

Light'scriteriaisconsideredasagoldstandardindiagnosingpleuraleffusiontilldate.
InviewofmoderatespecificityofLight'scriteriaforexudates,studiesarebeingdonetofindanew biomarkerfordiagnosingpleuraleffusion.
C-reactiveprotein(CRP),producedfromliveranditarrivesinpleuralspaceinintenseinflammatory conditionduetoincreaseinvascularpermeability.
Amongvariousmarkersstudied,CRPhasshowndiagnosticreliabilityindifferentiatingvariouscauses of pleural effusions.

Aimsandobjectives:-

Primaryobjective:

Todeterminethecutoffvalueofpleural fluid CRPfordifferentiating exudativefromtransudativepleuraleffusionsamongadultpopulation.

Secondaryobjective:

TofindouttheroleofpleuralfluidCRPinetiologicaldiagnosisof exudative Pleural effusion.

Methodology:-

Placeofstudy:NorthernRailwayCentralHospital,NEWDELHI
Durationofstudy:15months(January2020 -March2021)

Corresponding Author:- Dr. Madhu Kaushal
Address:- MBBS, M.D (Medicine) ACHD (Physician) Northern Railway Central Hospital (NRCH), New Delhi.

Typeofstudy:CrosssectionalObservationalstudy
Samplesize:60

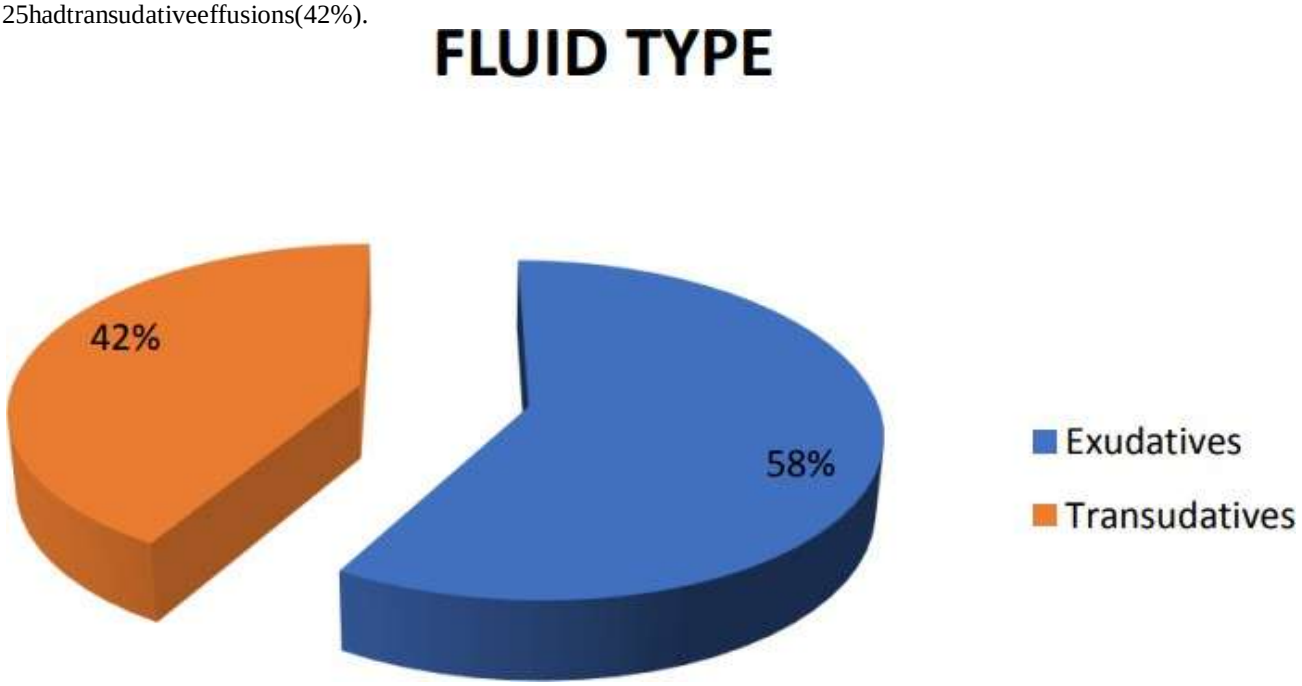
Inclusioncriteria:
1. AllPatientsdiagnosedwith pleural effusion and
2. Age>18years

Exclusioncriteria:
Alldiagnosedcasesofpleuraleffusionwith
1. Inadequateamountofeffusiondrainedfor diagnostic procedures
2. Anycontraindicationforthoracocentesis
3. Hemorrhagicdiathesis
4. Onanticoagulanttherapy.

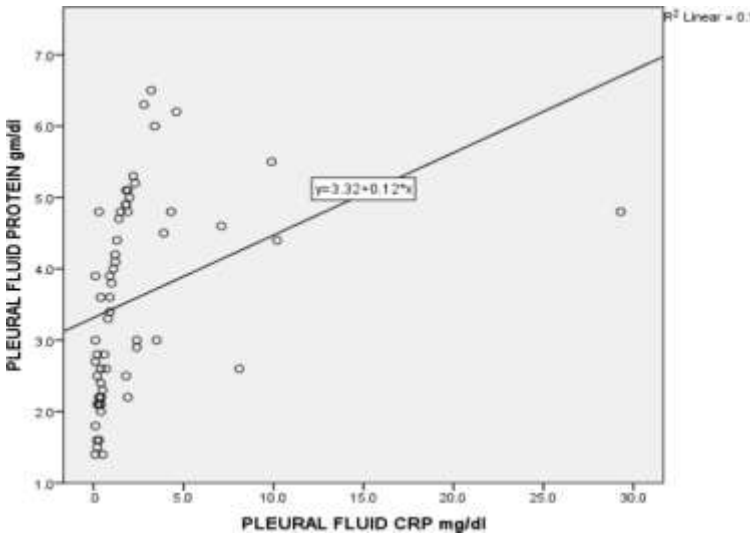
60 patients of pleural effusionwere recruited in the study based on inclusion and exclusion criteria, and after clinico-radiological assessment,thoracocentesis was done and pleural fluid analysed for various parameters. Subjectswere grouped intotransudativeandexudativeeffusionsbasedongoldstandardLight'scriteria.ThenCRPvalueswerecomparedindifferent exudative and transudative effusionsto determine its cut off value and also compared in various exudativeeffusions.

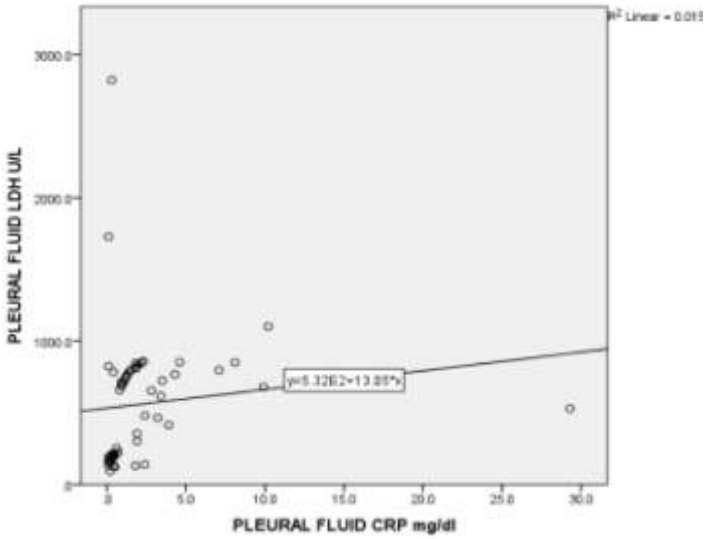
Results:-

Among60patientsinthestudy,
35hadexudativeeffusions(58%)and
25hadtransudativeeffusions(42%).



PleuralfluidCRPhasapositivecorrelationwithbothpleuralfluid protein and pleural fluid LDH.

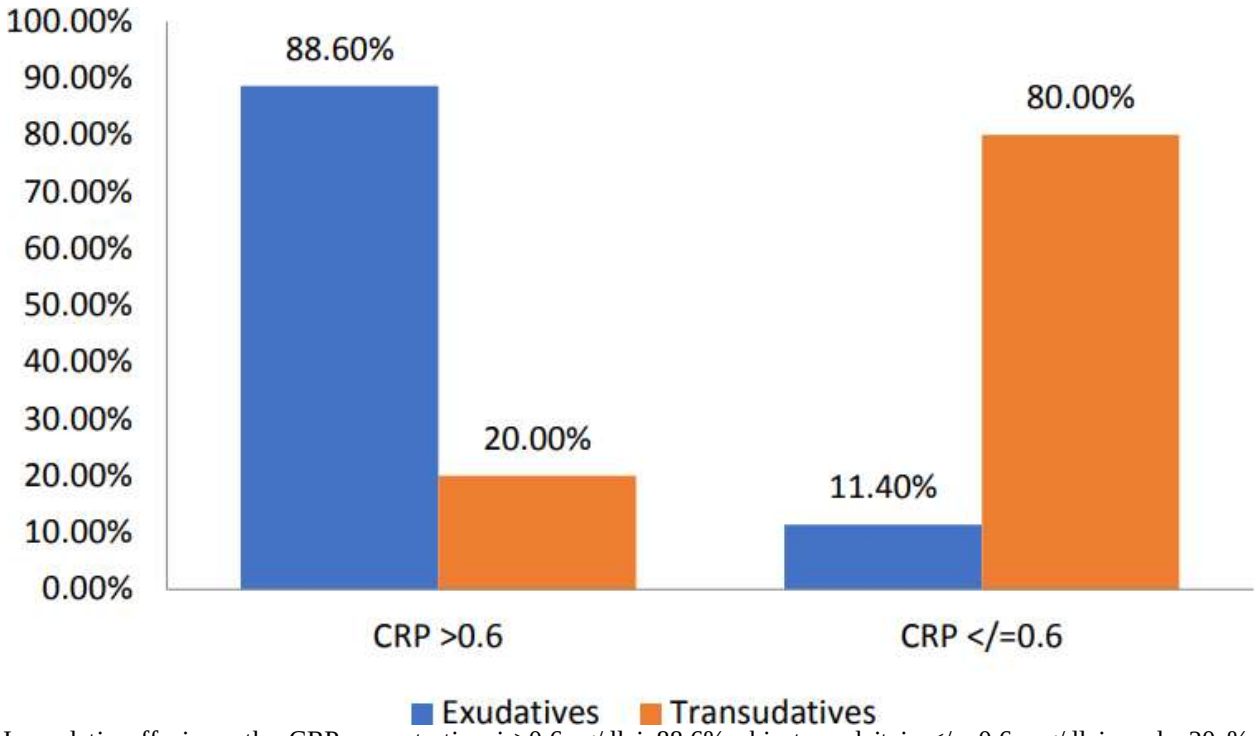




Pleuralfluidcrpinexudativesandtransudatives:

Variable	PARAPNEUMONIC			TB			MALIGNANT			OTHERS		
	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3
PLEURAL FLUID CRP mg/dl	8.1	7.1	10.2	2.2	1.8	3.2	1.1	.4	2.9	1.5	1.0	2.4
Kruskall Wallis test p =0.053												

Variable	Exudatives			Transudatives		
	Median	Q1	Q3	Median	Q1	Q3
PLEURAL FLUID CRP mg/dl	1.9	1.0	3.5	.4	.2	.5
Mann Whitney U test p value <0.001						



Inexudativeeffusions, the CRPconcentration is>0.6mg/dl in88.6%subjects and it is </= 0.6 mg/dl in only 20 % individuals

Intransudativeeffusions, theCRP concentrationin>0.6 mg/dl inonly20% andit is</=0.6IN80%individuals.

PleuralfluidCRPconcentrationatacutoff valueof0.6mg/dlhashighstatisticalsignificancefordifferentiating exudativeandtransudativepleuraleffusionswithapvalueof<0.001.

Discussion:-

Pleuraleffusionoccursduetovariousetiologicalreasonsthushavingdifficultyindiagnosis.Thecornerstone for diagnosing pleural effusion is identifying whether it is transudate or exudate.

Initiallypleuralfluidwasanalysedbasedonappearance/cellcount/specificgravity/proteinandLDH, everythinghavetheirownlimitations.

LightsCriteria stoodthetestoftimefornearlyfourdecadesanditaccuratelyclassified pleuraleffusionsand is widely accepted as the initial step in the management of pleural effusions .

DuetomoderatespecificityandsomedrawbacksinLight'scriteria,researchesarebeingdonefor identificationofanidealmarkerfordiagnosisofdifferentcausesofpleuraleffusion

Amongall markers studied,pleural fluid CRPis areliable indicator forthe differentiation ofbothmalignant as well as non malignant pleural effusions, and when used along with the Lights Criteria had a goodspecificity andsensitivityforseparationofthepleuraleffusionsanditrankedaboveotherbiomarkersstudiedintermsof its clinical utility to a clinch a diagnosis and being cost effective and a simple test.

Conclusion:-

PleuralfluidCRPhasasignificantroleindifferentiatingtransudativeeffusionsandexudativeswith a cut off value of 0.6mg/dl.Effusionsabove 0.6mg/dlare considered exudates and </= 0.6mg/dl are considered transudative effusions.

PleuralfluidCRPhelpsindifferentiatingvariouscausesofexudativeeffusionswithhighestin parapneumoniceffusionsfollowedbytuberculosisandlowestinmalignancy

ValuesofpleuralfluidCRPinparapneumonicrangesfrom7.1-10.2mg%intuberculosis1.8-3.2 mg% and in malignancy was 0.4 – 2.9 mg%

FinallypleuralfluidCRPcanbeincorporatedindiagnosticalgorithmofevaluationofpleural effusion.

Roleofpleuralfluidc–Reactiveproteinconcentrationindifferentiatingexudativefrom Transudativeeffusionsamongadultpopulation

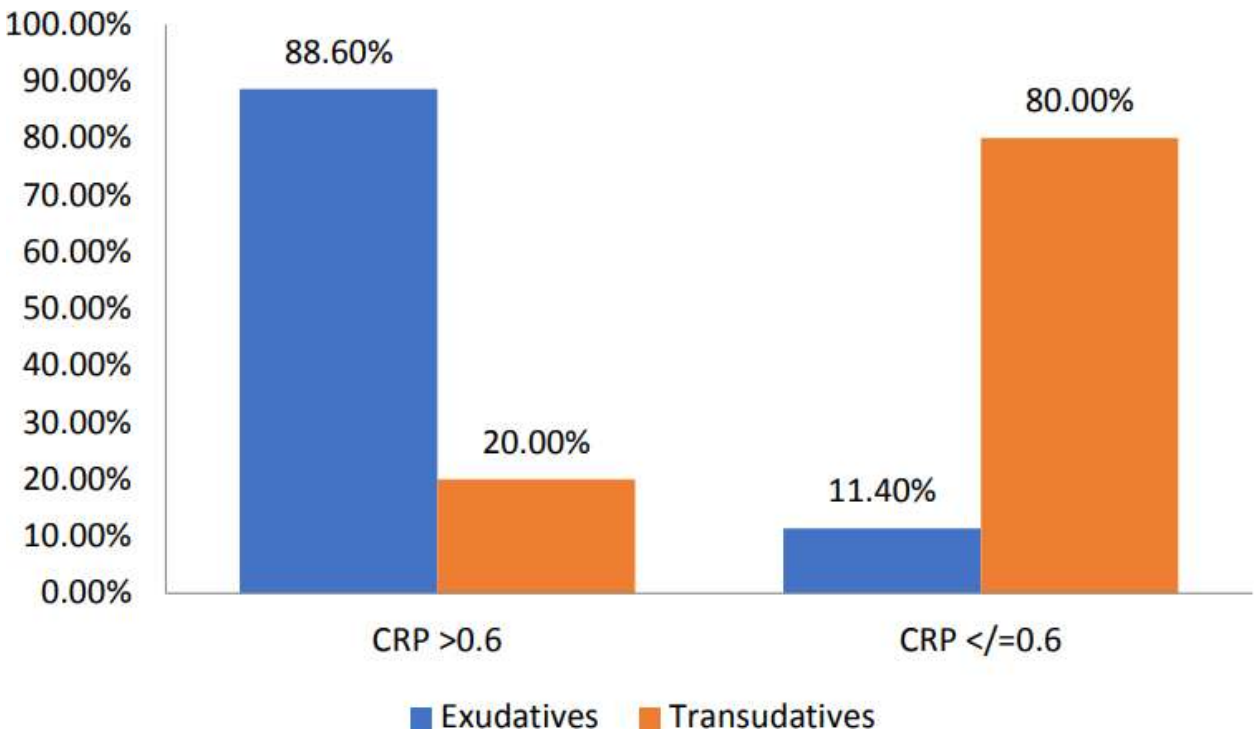
PRESENTER:Dr.VAMSIKRISHNA,Seniorresident,LHMC. GUIDE: Dr. MADHU KAUSHAL, PHYSICIAN , NRCH.

The estimated prevalence of Pleural effusion is 320 cases per 100000 population. In India it is morethan1millioncasesperyear..Light'scriteria is considered as a gold standard in diagnosing pleural effusion till date. Among various markers studied, CRP has shown diagnostic reliability in differentiatingvariouscausesofpleuraleffusions.

Methodology:-

60patientsofpleuraleffusionwererecruitedinthe study based on inclusion and exclusion criteria, and after clinico-radiological assessment, thoracocentesis was done and pleural fluid analysed for various parameters. Subjects were grouped into transudative and exudative effusions based on gold standard Light's criteria. Then CRP values were compared in different exudative and transudativeeffusionstodetermineitscutoffvalue and also compared in various exudative effusions

Results:-



Variable	Exudatives			Transudatives		
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Mann Whitney U test p value <0.001						

Variable	PARAPNEUMONIC			TB			MALIGNANT			OTHERS		
	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3
PLEURAL FLUID CRP mg/dl	8.1	7.1	10.2	2.2	1.8	3.2	1.1	.4	2.9	1.5	1.0	2.4
Kruskall Wallis test p =0.053												

Discussion:-

LightsCriteriastoodthetestoftime for nearly four decades. Due to moderate specificity and some drawbacks in Light's criteria, researches are being done for identificationofanidealmarkerfor diagnosis of different causes of pleuraleffusion.Amongallmarkers studied,pleural fluid CRP is a reliable indicator for the differentiation.

Conclusion:-

Pleural fluid CRP has a significant role in differentiating transudative effusions and exudatives with a cut off value of 0.6 mg/dl. Pleural fluid CRP helps in differentiating various causes of exudative effusions with highestinparapneumoniceffusions followedbytuberculosisandlowest in malignancy.