

A PROSPECTIVE OBSERVATIONAL STUDY ON CLINICAL IMPACT OF BIOMARKERS [C-REACTIVE PROTEIN (CRP), TROPININ-I] FOR THE EVALUATION OF THE EFFICACY OF PHARMACOLOGICAL TREATMENT & THEIR COMPARATIVE THERAPEUTIC OUTCOMES IN VARIOUS DISEASES

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INTRODUCTION

The biomarkers are critical in the rational development of medical therapeutics, but a significant confusion keep on regarding fundamental definitions and concepts involved in their use in research and clinical practices, it is particularly happens in the fields of chronic diseases and nutritional derangements. Clarification on the levels of different biomarkers, through therapeutic evaluation and their treatment outcomes the goal can be achieved.

AIM OF THE STUDY

- The present study is designed to understand the pathophysiology of the patients disease status through evaluation of various diagnostic and laboratory values, like various biomarkers (C-Reactive Protein-CRP, Troponin and Physiological values (BP, Temperature, SPO₂).
- To Identifying the therapeutic strategy and follow up with treatment progress of the patient.
- Quantifying the treatment outcomes and therapeutic outcomes by analysing the patients symptoms and disease status.

Need of the study

- It is need to understand levels of various biomarkers in various pathological conditions to develop the effective therapeutic strategies.
- To study the efficacy of the various treatment strategies in normalising the various biomarkers, physiological, biochemical parameters.
- To identify the potent and efficacious drugs among all the given drugs by knowing what drugs will show better action and better therapeutic effect to

reduce the amount of biomarkers to achieve the therapeutic goals and targets.

CRP

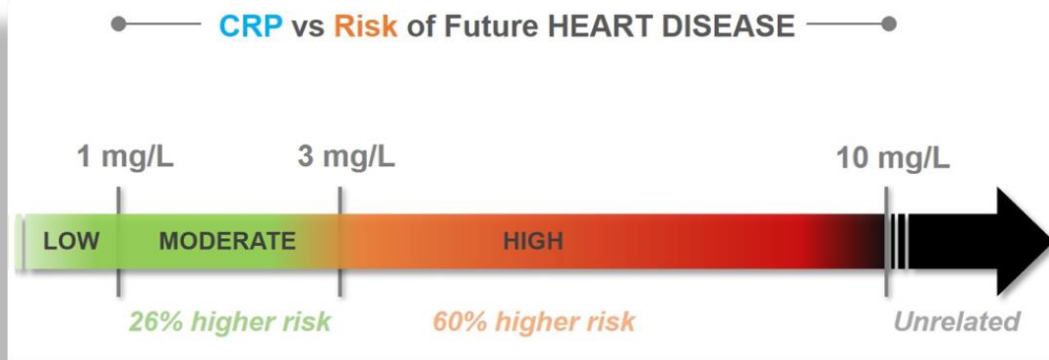
C-Reactive protein (CRP) is a protein that your liver makes. Normally, you have low levels of c-reactive protein in your blood. Your liver releases more CRP into your bloodstream if you have inflammation in your body. It is a **pentameric protein**. Inflammation is your body's way of protecting your tissues and helping them heal from an injury, infection, or other disease. **High levels of CRP** may mean you have a serious health condition that causes inflammation.

Elevated CRP levels causing SYMPTOMS

- ❖ Fever, chills
- ❖ Nausea, fatigue
- ❖ Muscle stiffness
- ❖ Acute inflammation
- ❖ SOB (shortness of breath)
- ❖ Pain
- ❖ Rash

Tabulation of CRP test results in heart diseases

CRP LEVEL (MG/L)	CARDIOVASCULAR RISK
<1	Low risk
1-3	Average risk
>3	High risk



To enumerate the CRP levels immunoassays and laser nephelometry methods are used. High sensitive CRP methods are used to know very low levels are used.

Indications

CRP test may be used to help find or monitor inflammation in a acute or chronic conditions include;

- ✓ Autoimmune disorders like Lupus, Rheumatoid Arthritis, and Vasculitis.
- ✓ Inflammatory bowel diseases.
- ✓ Disorders of the intestine like Crohn’s disease and Ulcerative Colitis.
- ✓ Asthma.
- ✓ Infections of bacteria or viruses.

TROPONIN

Troponin is a cardiac biomarker which plays a major role in the diagnosis of cardiac diseases. Cardiac arrest, heart attack, chest pain are the most common symptoms of the cardiac diseases they want to diagnosis properly. For this

troponin a cardiac biomarker is tested for cardiac emergencies.

By using high sensitive troponin the accurate values of troponin are evaluated. From 1995 cardiac troponins have been testing.

Pathophysiology

A cardiac disease myocardial infarction is a condition in which the blockage of the oxygen supply to the coronary vessels that may lead to the necrosis of the cells and results in death of the cells. During this process the blood vessels are ruptured then the cardiac troponins are detected in the blood stream.

The troponin levels usually arises within 2-3 hours at the start of chest pain and its going to be increased mostly from 12-48 hours. During this the cardiac troponin is tested in the patients.

RESULTS AND TABLES

Table 1: Results of mean C-Reactive protein (CRP) values in different diseases.

Sl. NO	Patient id	Disease	Mean CRP level (mg/l)
1	VG01	Pelvic inflammatory disease	6.3
2	GC03	Dengue	6.9
3	KV15	Fever	6.9
4	VG09	Jaundice	7.1
5	SK16	Fits	7.1
6	GC01	Dengue	7.3
7	VG14	Incisional hernia	7.4
8	SK03	High fever	7.5
9	VG02	Dengue	7.8
10	VG03	Dengue	8.3
11	GC09	Dengue	8.7
12	SK02	Fever	9.8
13	VG04	Dengue	10.2
14	GC12	Bronchiolitis	10.2
15	SK14	Bronchiolitis	11
16	VG13	High fever	11.7
17	SK10	High fever	12.4
18	GC13	Dengue	12.4
19	GC15	Fever	12.4
20	KV01	High fever	12.9
21	SK11	Fever	13.4

22	GC05	High fever	13.5
23	VG05	Dengue	13.7
24	GC08	Dengue	14.6
25	VG12	Dengue	15.3
26	KV02	Bloody diarrhea	16.4
27	VG06	Fever	16.9
28	SK09	High fever	20.4
29	SK06	Fits	22.9
30	SK04	High fever	26.3
31	KV03	Type-1 diabetes	28.1
32	SK08	Incisional hernia	36.2
33	GC07	Palpitation	39.6
34	VG07	Pelvic inflammatory disease	40.3
35	SK15	Fever	42.6
36	GC06	High fever	45.7
37	GC04	Pyogenic Meningitis	55.2
38	VG11	Fever	56.7
39	KV04	Burning micturition	63
40	KV05	Fever	71.1
41	VG08	Palpitations	79.2
42	GC10	High fever	111
43	SK07	High fever	130
44	SK05	High fever	132
45	SK12	Chest pain	171
		Median value	32.431
		Standard error	38.22

Table 2: Results of mean TROPONI-I values in different diseases.

SL.NO	Patient id	Symptoms	Mean Troponin-I level (ng/ml)
1	KV06	Chest pain	0.03
2	VG10	Asthma & palpitations	0.03
3	KV12	Chest pain	0.08
4	KV07	Chest pain	0.13
5	KV13	Chest pain & asthma	0.26
6	GC11	Myocardial infarction	0.76
7	VG08	Palpitations	1.04
8	KV11	Asthma	1.25
9	GC14	Chest pain	2.11
10	KV08	Chest pain	2.14
11	KV14	L.V. dysfunction	2.31
12	GC02	Palpitation	2.49
13	KV09	Chest pain	2.61
14	KV10	Chest pain	2.89
15	SK01	Chest pain	5
16	SK13	Chest pain	18.29
		Median value	2.588
		Standard error	4.40

Table 3: Results of disease wise patient data distribution Table.

Sl. No	Disease	Mean CRP	Mean TROPONIN-I
1	Asthma	-	1.25 (n=1)
2	Asthma & palpitations	-	0.03 (n=1)
3	Bloody diarrhea	16.4 (n=1)	-
4	Bronchiolitis	10.6 (n=2)	-
5	Burning micturition	63 (n=1)	-
6	Chest pain	171 (n=1)	3.69 (n=9)
7	Chest pain & asthma	-	0.26 (n=2)

8	Dengue	10.52 (n=10)	-
9	Fever	28.72 (n=8)	-
10	Fits	15 (n=2)	-
11	High fever	47.58 (n=11)	-
12	Incisional hernia	21.8 (n=2)	-
13	Jaundice	7.1 (n=1)	-
14	L.V dysfunction	-	2.31 (n=1)
15	Myocardial infarction	-	0.76 (n=1)
16	Palpitations	59.4 (n=2)	1.769 (n=2)
17	Pelvic inflammatory disease	23.3 (n=2)	-
18	Pyrogenic meningitis	55.2 (n=1)	-

Table-4: Results of therapeutic evaluation data distribution of CRP, TROPONIN-I CRP.

SL. NO	DRUG	No .of patients prescribed
1	Piperacillin,tazobactum	20
2	Ceftriaxone	15
3	Paracetamol	12
4	Cefeparazone+sulbactum	11
5	Ranitidine	10

TROPONIN-I.

SL. NO	DRUG	No .of patients prescribed
1	Heparin	18
2	Clopidogrel	16
3	Asprin	14
4	Atarvostatin	11
5	Hydrocortisone	8

Table 5: Results of drug wise data distribution.

SL.NO	Name of the drug	No. of prescriptions prescribed
1	Pantoprazole	39
2	Ondansetron	24
3	Piperacillin,tazobactum	20
4	Clopidogrel	16
5	Ceftriaxone	15
6	Heparin	15
7	Aspirin	14
8	Dexamethazone	13
9	Paracetamol	12
10	Atarvostatin	11
11	Cefeparazone+sulbactum	11
12	Ranitidine	10
13	Furosemide	8
14	Hydrocortisone	8
15	IV Fluids	8
16	Netilmicin	8
17	Norepinephrine	8
18	Budesonide	7
19	Doxycycline	7
20	Metronidazole	7
21	Ipratropium bromide	6
22	Levofloxacin	6
23	Pheneramine	6
24	Diltiazem	5
25	Phenobarbitone	5
26	Etophylline,theophylline	4
27	Hyoscine butylbromide	4
28	Insulin	4

29	Isosorbide mononitrate	4
30	Piracetam	4
31	Acetyl cystine	3
32	Alprazolam	3
33	Meropenum	3
34	Sodium valproate	3
35	Ticagrelor	3
36	Acyclovir	2
37	Ambroxol	2
38	Ambroxol & salbutamol	2
39	Bisacodyl	2
40	Carica leaf extract	2
41	Carvedolol	2
42	Cefeparazone	2
43	Cefodoxime	2
44	Chlorpheneramine malate	2
45	Clobazam	2
46	Corlanor	2
47	Glimepiridine & metmorfin	2
48	Levetacetam	2
49	Lignocaine	2
50	Linezolid	2
51	Metaprolol	2
52	Nitrofurantoin	2
53	Nitroglycerine	2
54	Oseltamir	2
55	Streptokinase	2
56	Tramedol	2
57	Aceclofenac	1
58	Amikin	1
59	Aminoglycoside antibiotic	1
60	Azithromycin	1
61	Calcium gluconate	1
62	Cilastazole	1
63	Clindamycin	1
64	Colchicine	1
65	Diclofenac	1
66	Dobutamine	1
67	Eldervit	1
68	Enoxoparia	1
69	Flavoxate	1
70	Glycopyrolate & neostigmine	1
71	Ivabradine	1
72	Ketorolac	1
73	Lactobacillus	1
74	Levocitrizine	1
75	L-ornithine aspartate	1
76	Methyl cobalamine	1
77	Metmorfin	1
78	Montelukast & levocitrizine	1
79	Multivitamin	1
80	Nebivolol & telmesatan	1
81	Phytonadione	1
82	Potassium chloride	1
83	Pyroxime HCL	1
84	Sodium picosulphate	1
85	Sulbactam sodium	1
86	Telmesartan	1

87	Tetanus toxoid	1
88	Ursodeoxycholic acid	1
89	Vecronium bromide	1

Table 6: Results of age wise patient data distribution Table.

SL.NO	Age range (in years)	CRP level (mg/l)	Trop-I level (ng/ml)
1	0-1	18.69231	-
2	2-20	21.505	-
3	21-40	63.466	2.315
4	41-60	70.88	1.55
5	61-80	31.366	1.275
6	81-100	-	18.29

Table 7: Results of mean values based on age.

SL.NO	Gender	CRP level (mg/l)	Trop-I level (ng/ml)
1	F	26.0652	1.01
2	M	39.08636	3.115

CONCLUSION

The biomarkers are play a major role in the diagnosis of the severity of the diseases. Inflammatory biomarker like C-reactive protein CRP which is used to diagnosis of inflammatory diseases and cardiac biomarker like troponin-I which will helps in to evaluate the severity of the study which will help to know the comparative therapeutic evaluation and treatment outcomes of the various disease through mean values of biomarkers. By our study evaluation we are conclude that.

- To reduce CRP levels antibiotics like piperacillin, tazobactam, ceftriaxone, cefepazone + sulbactam, and paracetamol, ranitidine are used for a better therapeutic effect.
- To reduce TROPONIN levels anticoagulants like (heparin), antiplatelet like (clopidogrel), NSAIDS like (aspirin), statins like (atorvastatin), corticosteroids like (hydrocortisone) are used for better therapeutic effect.

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