



CLINICAL PROFILE OF PATIENTS WITH ESR \geq 100 MM 1ST HR ADMITTED IN A TERTIARY CARE CENTRE

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ABSTRACT

Introduction and Aim: Extreme elevation the of erythrocyte sedimentation rate (ESR \geq 100 mm/1st hour) is usually associated with significant diseases. This study was performed to evaluate clinical profile of the patients at a tertiary care hospital.

Methods: Patients aged >18 years of either sex with raised ESR \geq 100mm/1st hour admitted in the indoor ward of the Department of Medicine, IGMC Shimla were included in the study. Patients with ESR <100 mm/1st hour, unwilling to undergo further investigation, or not willing to consent to participate in the study, were excluded from the study. Data were presented as frequency and percentages

Results: 1.84% of the patients (n=150) had ESR >100 mm/1st hour over the period of one year among all admitted patients in indoor ward of the Department. Renal failure was the most common cause of elevated ESR (48.7%) followed by infections (36.7%), malignancy (10%), endocrine disorders (6%), cardiovascular disease (5.3%), liver disease (5.3%), and connective tissue disorders (4%).

Conclusion: Renal failure was the most common cause of elevated ESR in our patients.

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INTRODUCTION

The erythrocyte sedimentation rate (ESR) is indicator of disease with increased sedimentation of erythrocytes in acute and chronic inflammation infection, trauma and malignancies. It is an inexpensive and simple test. ESR refers to the rate of fall of red blood cells (RBCs) suspended in plasma. It depends upon the difference in specific gravity between RBCs and plasma, but it is influenced greatly by the extent to which the RBCs form rouleaux, which sediment rapidly.

RBC intrinsic factors may affect sedimentation; for example, sickle cells and spherocytes sediment slowly, while large RBCs (macrocytes) sediment rapidly. Hyperviscosity, polycythemia and extreme leukocytosis decrease sedimentation while anemia (unopposed by RBC abnormality) enhances sedimentation. Therefore, high ESR is found in conditions that elevate fibrinogen level such as infections, inflammatory diseases, collagen vascular diseases, malignancies (particularly if there is tissue degeneration or metastases), end-stage renal diseases and pregnancy. Hypoalbuminemia (e.g. associated with nephrotic syndrome) elevates the ESR. It is also elevated in conditions that cause immunoglobulinemia, e.g. multiple myeloma. Extreme elevation of ESR (defined as a rate \geq 100 mm/hour) is often associated with serious diseases.^{1,2} Mild to moderate elevation of ESR is a common observation among medical patients.

However occasionally, we find exceptionally high value of ESR i.e. \geq 100 mm/1st hr. Hence, the present study was aimed to evaluate clinical profile of these patients.

SUBJECTS AND METHODS

This prospective observational study was conducted over a period of one year (Jul 2014 to Jun 2015) at Department of Medicine, IGMC Shimla. Patients aged >18 years of either sex with raised ESR \geq 100mm/1st hour admitted in the indoor ward of the Department were included in the study. Patients with ESR <100 mm/1st hour, unwilling to undergo further investigation, or not willing to consent to participate in the study, were excluded from the study.

Ethical consideration

The study was approved by ethics committee of the institute at IGMC, Shimla. Patients were included after they agreed to provide consent to participate in the study.

Data collection

A careful history from the patient or from a reliable caretaker of the patient was collected. History included full demographic profile, illness of the patient, mode of onset of illness, age of onset of illness, history of fever, pain abdomen, jaundice, loss of appetite, weight loss, loose stools, bleeding from any site. History of medication intake or ATT, alcohol abuse, previous hospitalization was taken. Family history of any malignancy, connective tissue disorders was elucidated.

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Investigations

Laboratory investigations, chest X-ray and other investigations for the cause of the elevated ESR were done.

Data analysis

Data were presented as frequency and percentages.

Table 1 General characteristics

	n	%
Age (Years)		
19-30	25	16.7
31-40	19	12.7
41-50	35	23.3
51-60	30	20
60-70	18	12
>70	23	15.3
Sex		
Male	78	52
Female	72	48
Occupation		
Housewife	61	42.7
Farmer/Labourer	48	33.6
Service	21	12.6
Student	19	13.3
Professional	1	0.7
Personal history		
Alcohol and Smoking	44	30.8
Alcohol	25	17.5
Smoking	5	3.5
Past history		
Hypertension	60	42
Diabetes Mellitus	53	37.1
COPD	3	2

Table 2 Laboratory examination

	n	%
Hb (gm%)		
<10	131	87.3
≥10	19	12.7
Leukocyte count (mm ³)		
<4000	14	9.3
4000-11000	72	48
>11000	64	42.7
Platelets (lacs)		
<150000	59	39.3
HbA1c		
>7%	38	25.3
Serum Protein (g%)		
<5.5	98	65.3
Serum Albumin (g%)		
<3.2	104	69.3
Serum Bilirubin (mg%)		
>1.1	27	18
HIV ELISA	4	2.7
IgM Scrub Typhus	2	1.3
HBV	1	0.7
HCV	1	0.7

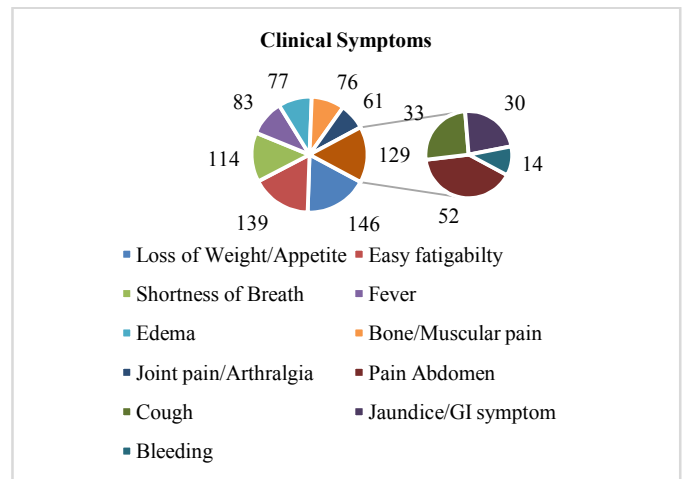


Figure 1 Clinical symptoms

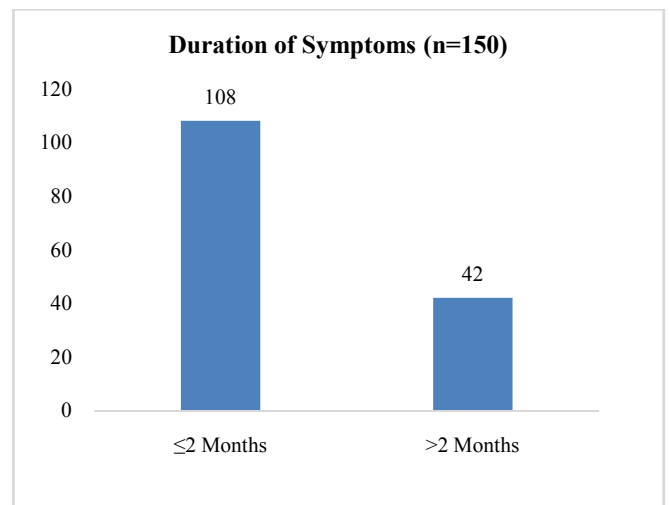


Figure 2 Duration of symptoms (n=150)

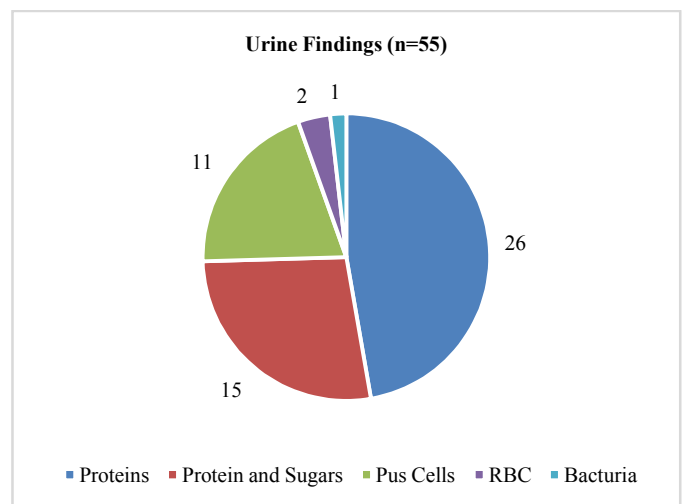


Figure 3 Urine examination (n=55)

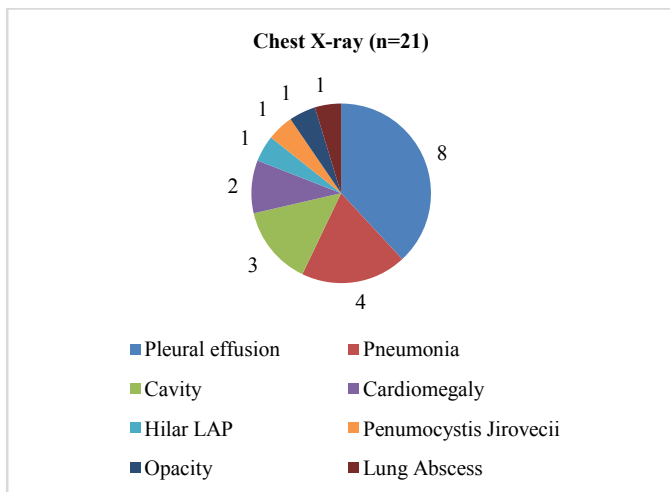


Figure 4 Chest X-ray examination (n=21)

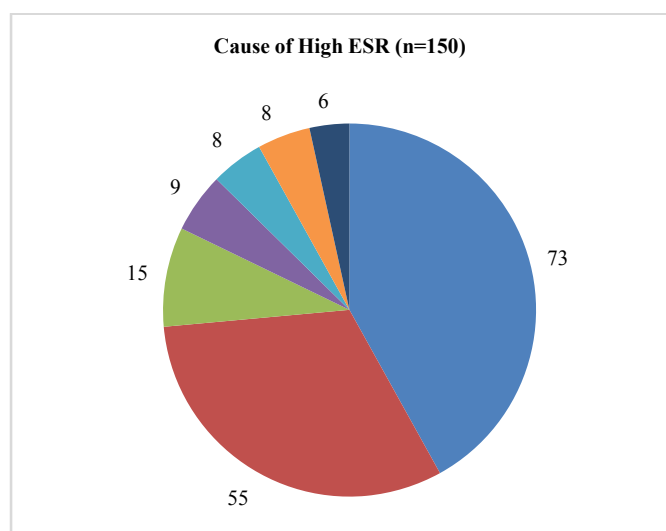


Figure 5 Cause of elevated ESR (n=150)

RESULTS

During the study period, 8111 patients admitted in indoor wards of the Department of Medicine. Out of these patients, 150 patients were included in the study with ESR 100mm/1st hour.

General characteristics

Table 1 shows general characteristics of the study subjects. Majority (23.3%) of the patients aged between 41 and 50 years. Male to female ratio was 1.08:1. 42.7% of the patients were housewives. 30.8% patients were consuming alcohol as well as smokers. 42% of the patients had previous history of hypertension.

Clinical symptoms

96% of the patients had constitutional symptoms in the form of loss of weight and appetite. Easy fatiguability was present in 92.7% patients. The least common symptom was abnormal bleeding in 14 (9.3%) patients (Figure 1). 28% of the patients had duration of symptoms of more than 2 months (Figure 2).

Laboratory findings

Table 2 shows laboratory findings. Haemoglobin was low (<10 gm%) in 131 patients which was most common finding and the least common finding was hypernatremia in one patient and

positive Hepatitis B and Hepatitis C in one patient each. Serum creatinine was raised in 74 patients. HbA1C was raised in 38 patients. Serum albumin was low in 104 patients.

Chest X-ray examination

Chest X-ray was abnormal in 21 patients. 8 patients had evidence of pleural effusion. There was one patient each of lung abscess, lung opacity, hilar lymphadenopathy and *pneumocystis jirovecii* (Figure 4). Skeletal survey had evidence of lytic lesion in three patients

Cause of elevated ESR

Renal failure was the most common cause in 48.7% patients followed by infections (36.7%) (Figure 5).

DISCUSSION

Extreme elevation of ESR (≥ 100 mm/hour) is alarming and should be considered a sign of a significant underlying disease. The frequency of this extreme elevation in our patient population (1.84%) was lower that reported previously in adult patients (2.5%,¹ 3%,³ 4.2%⁴).

The most common cause of elevated ESR in our population was renal failure. In studies by Bathon *et al*⁵ and Al-Homrany⁶, there was extreme elevation of ESR in 20% and 32% of the patients, respectively.

Infection was the second most common cause of extreme elevation of ESR, accounting for 36.7% of the cases, which is similar to the findings in other studies (33%⁴, 44.2%¹, 45.5%⁵). Connective tissue diseases were the least common diagnostic category causing extreme elevation of ESR, and this is not in agreement to the findings of previous study.¹ In areas where both rheumatic fever and brucella arthritis are common, an ESR ≥ 100 mm/hour may favor the diagnosis of rheumatic fever arthritis; this is particularly helpful in patients presenting with arthritis as a sole major feature. Malignancy was the third most common cause of ESR ≥ 100 mm/hour. Although malignancy was reported to be the most common cause in a very early study (58% of cases),⁸ subsequent studies have shown this to be the third leading cause.^{1,2,4}

Renal failure, nephrotic syndrome and glomerulonephritis are frequent causes of extreme elevation of ESR. Infections, malignancy, connective tissue diseases and uremia are known to increase fibrinogen level and cause anemia and these in turn may elevate the ESR. However, the mere finding of extreme elevation of ESR should not trigger lists of advanced and invasive investigations searching for some of these diseases, as the clinical scenario at hand should dictate further investigations.

In conclusion, extreme elevation of ESR is uncommon and is most commonly associated with renal diseases.

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