



Asian Journal of Pharmaceutical Analysis and Medicinal Chemistry

Journal home page: www.ajpamc.com



AN OVERVIEW ON “SYMPTOMS AND SOME NOVEL DRUG TREATMENT FOR EOSINOPHILIC PNEUMONIA”

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ABSTRACT

Eosinophils is a type of white blood cells i.e. WBC. Eosinophilic pneumonia is a example of group of lung diseases in which eosinophils (a type of white blood cell) appear in increased numbers in the lungs and usually in the blood stream. These cells cause disruption of the normal air spaces i.e. Alveoli. The medications abuse gives Eosinophilic pneumonia for example; NSAID, Phenytoin, Nitrofurantoin, L-tryptophan and Daptomycin abuse, Inhalation of Heroin, cocaine etc. Chemicals such as Aluminum Silicates and Cigarette Smoking can cause EP. Parasites cause Eosinophilic pneumonia EP in three different ways. Parasites can either invade the lung; live in the lung as part of life cycle or to be spread to the lung by the blood stream. Eosinophilic pneumonia (EP) is diagnosed by a combination of characteristic symptoms or by physical examination or by blood tests and X-rays.

KEYWORDS

Acute Eosinophilic Pneumonia (AEP), Chronic Eosinophilic Pneumonia (CEP), Corticosteroids, Prednisone, Dexamethasone and Methyl Prednisone.

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INTRODUCTION

Eosinophilic pneumonia (EP) is a disease in which eosinophils accumulates in the lungs. Eosinophils is a type of white blood cells i.e. WBC. Eosinophilic pneumonia is an example of group of lung diseases. Eosinophils are a type of white blood cell and they are appearing in increased numbers in the lungs and usually in the blood stream. These cells cause disruption of the normal air spaces i.e. Alveoli. In Alveoli oxygen was extracted from the atmospheres¹. There are several different kinds of eosinophilic pneumonia present or exist and can

occur in any age group of the patient. Eosinophilic pneumonia (EP) is diagnosed by a combination of characteristic symptoms or by physical examination or by blood tests and X-rays. Eosinophilic pneumonia (EP) is divided into different categories; and it depending upon whether a cause can be determined or not. Eosinophilic pneumonia also occurs when immune system of the lung is low then this disease is known as Eosinophilic Granulomatosis with polyangiitis². When a cause of this disease cannot found, then the Eosinophilic pneumonia EP is considered as labeled Idiopathic. Idiopathic Eosinophilic pneumonia can be divided into "Acute eosinophilic pneumonia "(AEP) and "Chronic eosinophilic pneumonia" (CEP) depending on the symptoms a person. Eosinophilic pneumonia can depends on the underlying cause of the disease. Eosinophils play a central role in defending the body against infection by parasites. Medication and its abuse and environmental exposure may give Eosinophilic pneumonia. The medications abuse gives Eosinophilic pneumonia for example; NSAID, Phenytoin, Nitrofurantoin, L-tryptophan and Daptomycin abuse, Inhalation of Heroin, cocaine etc. Chemicals such as Aluminum Silicates and Cigarette Smoking can cause EP. Parasites cause Eosinophilic pneumonia EP in three different ways. Parasites can either invade the lung; live in the lung as part of life cycle or to be spread to the lung by the blood stream³.

Causes⁴⁻⁵

The exact reason of eosinophils accumulate in the lungs is not well understood. It may be a type of allergic reaction. There are some known causes of eosinophilic pneumonia, it includes;

- Cigarette smoke.
- Certain drugs for example, penicillin, amino salicylic acid, Carbamazepine, L-tryptophan, Isoniazid, Phenytoin, Chlorpropamide and sulfonamide drug like Trimethoprim, sulfamethoxazole etc.
- Chemical fumes for example, cocaine or nickel inhaled as a vapor.
- Fungi for example *Aspergillus fumigatus*.

- Parasites for example roundworms, including nematodes.
- Systemic disorders.

Signs and symptoms⁶⁻⁸

Eosinophilic pneumonia (EP) has similar signs and symptoms. It gives some side effects like cough, fever, breathing problem and sweating at night. Acute eosinophilic pneumonia gives signs and symptoms than chronic types. Fever and cough may develop only one or two weeks before breathing difficulties. Chronic eosinophilic pneumonia develops slowly. Signs and symptoms accumulate over several months and include fever, cough, difficulty breathing, wheezing, and weight loss. Eosinophilic pneumonia can easily develop in several different ways. It depends on the underlying cause of the disease. Eosinophils play a central role in the body against infection by parasites. Parasites cause Eosinophilic pneumonia EP in three different ways. Eosinophils migrate to the lung in order to fight the parasites and EP results. There are some parasites includes *Paragonimus lung fluks* and tape worms *Echinococcus* and *Tanenia Solium*. When EP is caused by this last group, then it is known as Loffer's Syndrome. The causes for both AEP and CEP are unknown as of 2005. Symptoms may be mild or life threatening for acute or chronic eosinophilic pneumonia. It includes following types like,

1. Acute eosinophilic pneumonia progresses quickly. Acute eosinophilic pneumonia may cause fever, chest pain worsened by deep breathing, shortness of breath, cough, and a general feeling of illness. The level of oxygen in the blood can decrease.
2. Chronic eosinophilic pneumonia slowly progresses over days or weeks. Chronic eosinophilic pneumonia is a distinct disorder that may also become severe. Life-threatening shortness of breath can develop if the condition is not treated.

Diagnosis⁹

When doctors suspect eosinophilic pneumonia, they first do a chest x-ray. In acute eosinophilic pneumonia, the chest x-ray is abnormal, but similar abnormalities can occur in other conditions.

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In chronic eosinophilic pneumonia, chest x-rays are more effective for diagnosis. It can be identifying by following methods,

- Chest x-ray and computed tomography
- Bronchoscopy
- Blood tests to measure eosinophils

Eosinophilic pneumonia is diagnosed in one of three circumstances. It was diagnosed by chest C-ray or by computed tomography i.e. CT which identifies the abnormalities in the lung. A chest x-ray can show abnormalities anywhere, but the most specific finding is increased shadow in the periphery of the lung, away from the heart.

Treatment¹⁰⁻¹²

When due to acute eosinophilic pneumonia "(AEP) and" chronic eosinophilic pneumonia" (CEP) was treated with help of corticosteroids which result in a rapid, dramatic resolution of symptoms over the course of one or two days. Corticosteroids like Prednisone, Dexamethasone and Methyl Prednisone are used to control this problem.

Prednisone

Prednisone was example of synthetic corticosteroid drug. This drug works as immunosuppressant drug. This drug was used in the treatment of inflammatory disease like allergic reaction and some cancer with high side effect.

History

The identification and discovery of this prednisolone and prednisone were done in 1950 by the scientist Arthur Nobile. The first synthesis of prednisone was done in 1955 in the laboratory by the scientist Arthur Nobile and coworkers. Cortisone was converted into prednisone by oxidation processes and by the enzymes of bacterium *Corynebacterium simplex*. The same technique or reaction was used for preparation of prednisolone from hydrocortisone. The scientist Schering and Upjohn was discovered the Prednisolone and prednisone under the brand name Meticorten and Delta-Cortef respectively.

Uses

This drug is used in the treatment of asthma, COPD, rheumatic disorder, allergic reaction, ulcerative colitis, Crohn's disease, adrenal cortical disease,

hyperkalemia, tuberculosis and pneumonitis. This drug also used to treat "chronic eosinophilic pneumonia" (CEP); lupus, nephritic syndrome, Meniere's disease. This drug is used in the treatment of migraine headache and cluster headache and effective in aphthous ulcer. This drug is effectively used in the chemotherapy of cancer like acute lymphoblastic leukemia, Hodgkin's lymphomas, non-Hodgkin's lymphomas and multiple myeloma with other hormone sensitive cancer. This drug is used in the herheimer reaction and syphilis, lupus. It was used to treat acute eosinophilic pneumonia" (AEP) and "chronic eosinophilic pneumonia" (CEP)

Side effect

The side effect of this Prednisone includes increase blood sugar level, emotion problem, weight gain, immunosuppression, facial swelling, depression, psychosis, fatigue, weakness, mental confusion, memory loss, blurred vision, abdominal pain, peptic ulcer, painful hups, osteonecrosis, stretch marks, insomnia, joint pain, anxiety.

Dexamethasone

Dexamethasone was example of steroid. This drug was used as anti-inflammatory and immuno suppressant effect. This drug is 25 times more potent than cortisol and gives minimum mineral corticosteroid effect. This drug is used in the treatment of rheumatoid disease. This drug is used in the skin disease like erythema multiform, allergic reaction, chronic lung disease, crop and cerebral edema and tuberculosis infections. This drug classify as per category C in Australia. This drug does not gives any side effect on pregnant women and baby also. It was used to treat acute eosinophilic pneumonia" (AEP) and "chronic eosinophilic pneumonia" (CEP).

Uses

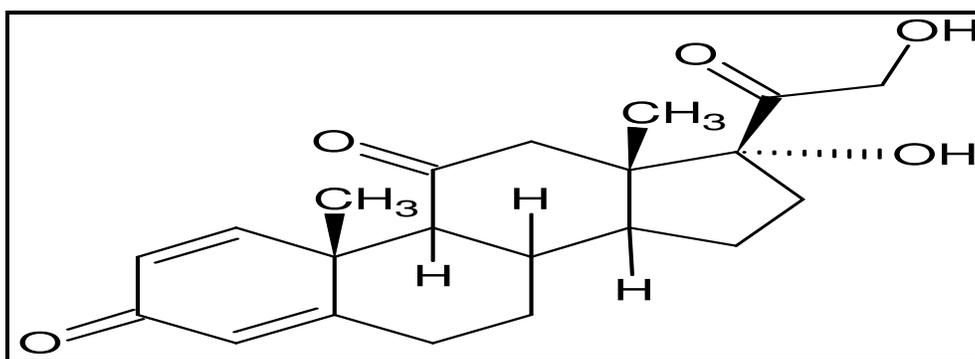
Dexamethasone was used in the treatment of many inflammatory and autoimmune diseases like "chronic eosinophilic pneumonia" (CEP) and in bronchospasm. In Idiopathic thrombocytopenia purpura disease, this drug gives decrease the platelets count. This drug is used in the dental surgery. This drug is used in high dose in allergic anaphylactic shock. This drug is used in eye drops

and in eye surgery and in nasal spray and ear drops. The trade name of this drug for use of nasal spray is Dexacort and trade name of ear drop is Sofradex. Sofradex contain, Dexamethasone was used in combination with other drug like antibiotic and antifungal also. Dexamethasone was used in the bacterial meningitis.

Dexamethasone was used in chemotherapy of cancer, and used as antiemetic. This drug is effectively used in the brain tumors. This drug is used in edema, haematological malignancies, and multiple myeloma in which this drug was alone or in combination. This drug is used in the very rare disease like glucocorticoid and Addison's disease, congenital adrenal hyperplasia in adults.

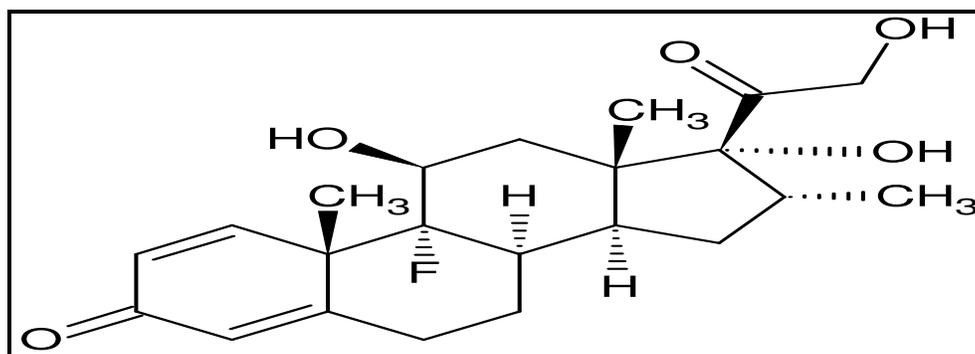
Side effect

The side effect of this drug is acne, insomnia, vertigo problem, increase the appetite, Weight gain, and skin healing, depression, hypertension, vomiting, confusion, amnesia, irritability, nausea, and headache.



Systematic (IUPAC) name

17, 21-dihydroxypregna-1, 4-diene-3, 11, 20-trione



Systematic (IUPAC) name

8S, 9R, 10S, 11S, 13S, 14S, 16R, 17R)-9- Fluoro-11, 17-dihydroxy-17-(2-hydroxyacetyl)-10, 13, 16-trimethyl-6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17- dodecahydro-3H-cyclopenta [a] phenanthren-3-one

CONCLUSION

Eosinophilic pneumonia is an example of group of lung diseases in which eosinophils (a type of white blood cell) appear in increased numbers in the lungs and usually in the blood stream. These cells cause disruption of the normal air spaces i.e. Alveoli. In Alveoli oxygen was extracted from the atmospheres. There are several different kinds of eosinophilic pneumonia present or exist and can occur in any age group of the patient. Eosinophilic pneumonia (EP) is diagnosed by a combination of characteristic symptoms or by physical examination or by blood tests and X-rays. Acute eosinophilic pneumonia "(AEP) and" chronic eosinophilic pneumonia" (CEP) was treated with help of corticosteroids. Corticosteroids like Prednisone, Dexamethasone and Methyl Prednisone are used to control this Eosinophilic pneumonia.

ACKNOWLEDGEMENT

I'm very thankful to Department of pharmaceutical chemistry, PRES's College of Pharmacy, Chincholi, Nashik, Maharashtra. I would also like to thank the Management and Dr. C. J. Bhangale and Mr. Vikas Kunde for providing the necessary facilities to carry out this work.

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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Please cite this article in press as: Rohit Jaysing Bhor and Gaikwad Rohini Jagannath. An overview on "symptoms and some novel drug treatment for eosinophilic pneumonia", *Asian Journal of Pharmaceutical Analysis and Medicinal Chemistry*, 6(1), 2018, 1-5.