A Case of Good’s Syndrome Presenting with Pulmonary Tuberculosis

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Abstract

Adult onset immunodeficiency associated with thymoma is a rare condition. The combination of hypogammaglobulinemia, reduced number of peripheral B and CD4+ T cells, along with thymoma constitutes Good’s syndrome (GS). This immunodeficiency condition is often complicated with opportunistic infection with organisms, like bacteria (Haemophilus influenzae, Streptococcus pneumoniae etc), viruses (Cytomegalovirus, Herpes simplex etc), fungi and protozoa. We present an unusual case of Good’s syndrome with pulmonary tuberculosis (PTB). A 40-year-old man presented with sputum-positive PTB and was started on anti-tuberculosis treatment. Subsequently, he developed symptoms and findings consistent with thymoma and other components of Good’s syndrome. Although patients of Good’s syndrome are susceptible to various opportunistic infections, infection with Mycobacterium tuberculosis is uncommon. Evidence of recurrent infections or some opportunistic infection in a thymoma patient should trigger a suspicion of Good’s syndrome.


Key words: Thymoma, Good’s syndrome, Tuberculosis, Opportunistic infection.

Introduction

Good syndrome is a rare, adult onset, combined B- and T- cell immunodeficiency with thymomas, first described by Dr Robert Good in 1954¹. Its main components are: thymoma, hypogammaglobulinemia, low or absent B cells, deficient CD4+T cell and an abnormal CD4:CD8 ratio in peripheral blood.²³ The average age group commonly affected by Good’s syndrome is 40 to 70 years. The expert committee of the World Health Organization and International Union of Immunological Societies on primary immunodeficiency has classified Good’s syndrome as a distinct clinical entity.⁴ The pathogenesis, aetiology of Good’s syndrome is still unknown. However some evidence indicates some defect in the bone marrow itself, e.g. pre-B cell arrest, impaired maturation of cell subsets.⁵

Case Report

A 40-year-old male, smoker, with a history of repeated sino-pulmonary infections since the past few years, was diagnosed to be having sputum-positive pulmonary tuberculosis (PTB). His chest radiograph showed patchy lesions throughout the right lung field (Figure 1). He was started on treatment with isoniazid, rifampicin, pyrazinamide, and ethambutol. He responded well and sputum conversion was achieved at the end of two months of treatment. But, he returned back with a new set of symptoms while on the continuation phase of tuberculosis treatment. This time...
there was shortness of breath, dull aching central chest pain and hoarseness of voice, which compelled him to return.

On clinical examination, the only positive findings were, dullness on percussion over the manubrium sterni and reverse D’Espine sign on auscultation (i.e., bronchial breath sound and bronchophony heard over supracardiac vessels area). A repeat chest radiograph revealed widening of mediastinal shadow involving the right para-tracheal–parahilar and left parahilar areas and partial resolution of previous tubercular lesions in the right lung field (Figure 2). Fibreoptic laryngoscopy showed left vocal cord palsy. Contrast-enhanced computed tomography (CECT) of thorax revealed a large anterior mediastinal mass, having heterogeneous texture and irregular outline without significant contrast enhancement or involvement of neighbouring structures (Figure 3). A core-needle biopsy under CT guidance was performed. Histopathology showed angulated lobules separated by fibrous band. Lobules contained sheets of small cells having round nuclei with dense chromatin and scanty cytoplasm, resembling lymphoid cells along with scattered thymic epithelial cells with round to oval nuclei and pale staining cytoplasm and a few Hassall corpuscles (Figure 4). On immunohistochemistry, the thymic epithelial cells were positive for cytokeratin and the background lymphoid cells had a naive T-cell phenotype (TdT+; CD3+; CD20+). This was consistent with thymoma. Further investigations at this juncture, revealed that the patient had: (1) hypogammaglobulinemia: IgA = 22 mg/dL (Reference range = 56 – 352 mg/dL), IgM = 48 mg/dL (Reference range = 70 – 312 mg/dL), IgG = 316 mg/dL (Reference range = 639 – 1329 mg/dL); (2) reduced number of CD 4+ T cells = 348/mL (Reference range = 588 – 1202 mg/dL); and (3) B-cell depletion (only 1% of total lymphocytes).

Discussion

Good’s syndrome, an adult onset combined immunodeficiency with thymomas, is a rare entity. Western literature reports the incidence of Good’s
syndrome as 5% to 10% of all thymomas, whereas it is rare in the eastern part of the globe, 0.2%–0.3% as per Japanese literature.¹ Tarr and colleagues² has reviewed 51 cases of Good’s syndrome. Among them encapsulated organisms like *Haemophilus influenza* were found in 24% cases (most common), followed by *Streptococcus pneumonia* in 8% cases and other gram-negative organisms lie *Pseudomonas spp*, *Klebsiella spp* etc. Among other infections, mucocutaneous candidiasis was found in 24% cases, and in patients having chronic diarrhoea, protozoa like *Giardia lamblia* and enteropathic organisms like *Salmonella spp* and *Campylobacter jejuni* were reported.² In a report from the USA,³ concomitant infection with *Clostridium difficile* and *Babesia microti* and colonisation of lower respiratory tract with *Pseudomonas aeruginosa* causing repeated lower respiratory tract infection and evidence of Kaposis’s sarcoma on feet were described.

Unlike other humoral immune defects, like common variable immunodeficiency and X-linked agammaglobulinemia, opportunistic infection with *Cytomegalovirus* and *Pneumocystis carinii* are common in Good’s syndrome, as observed by Kelleher and Misbah.⁴ Another interesting fact is that, in comparison to human immunodeficiency virus-infected patients, opportunistic infections can occur at a higher level of CD4+ T cell count in Good’s syndrome.² Opportunistic infection by *Mycobacterium tuberculosis* has been uncommonly described in Good’s syndrome, in contrast to HIV-infected patients. Tarr et al前沿 found only two cases of tuberculosis among 51 cases of Good’s syndrome.

Good’s syndrome is commonly diagnosed in 4th or 5th decade, and the mean age of symptomatic presentation is 56 years (range 29–75 years). The mean age for the detection of thymomas and hypogammaglobulinemia is 62 years (range 41–79 years).² The mean age for the presentation is 56 years (range 29–75 years). The mean age of symptomatic opportunistic infections can occur at a higher level of the B- and T- cell subsets.¹³ Flow cytometry, especially the single platform flow cytometry technology gives the most reproducible result in identification of the B- and T- cell subsets.¹⁰ Histopathology of thymomas in Good’s syndrome is usually benign, commonly spindle cell variant. Thymic carcinomas are uncommon.¹¹

Treatment of thymomas is surgical — either removal or debulking.⁹ Removal does not reverse the immunological defects. Immunoglobulin replacement therapy is required for antibody deficiency.⁴ The most strategic prognostic indicator is totality of tumour removal.⁹,¹²

In conclusion, our case of Good’s syndrome with *Mycobacterium tuberculosis* infection, which antedates the clinical manifestation of thymoma, gives us the following insights — Serum immunoglobulin level and amount of B- cell and T- cell subsets should be measured in all patients of thymomas; CT scan of thorax should be considered, if clinical suspicion of thymomas exists; *Mycobacterium tuberculosis* may be associated with Good’s syndrome; and If a case of tuberculosis re-visits with microbiological improvement but clinical deterioration, one should investigate thoroughly for other underlying disorders.

References


