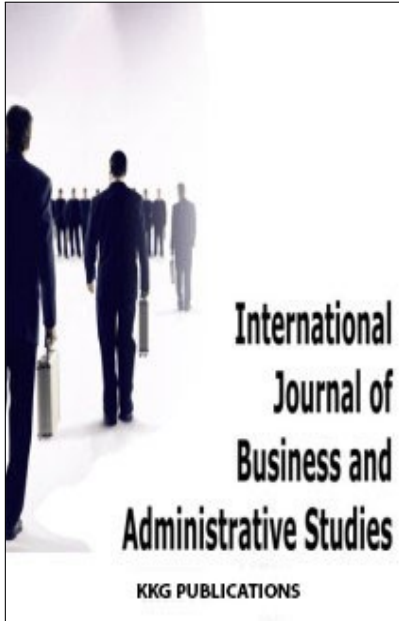


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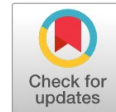
Economic Burden of Psoriasis: Review of Literature

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ECONOMIC BURDEN OF PSORIASIS: REVIEW OF LITERATURE

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Abstract. Psoriasis is a chronic inflammatory skin disease that primarily affects the skin and joints. Although the disease is non-life threatening, psoriasis patients usually need lifelong care, which equals lifetime expenses. Many cost analysis studies on psoriasis have not been comprehensive in calculating both its direct and indirect costs, and there are very limited studies on the economic burden of this disease in Asian countries. Therefore, a systematic literature review was done to gain a comprehensive understanding of the economic burden of psoriasis throughout the world. Observational studies and Randomized Controlled Trials (RCTs) published in the period 2000 to 2014 and Reporting on the direct and indirect costs of psoriasis were included. The search for literatures in the PUBMED database using keyword “economic burden of psoriasis”, “direct cost” and “indirect cost” has produced 182 articles. Of all the articles identified, 37 reports studies have met the inclusion criteria. Direct costs were higher than indirect costs, with hospitalization, medication prescription, travel, and treatment costs as significant aspects. Loss of productivity and wage (indirect costs borne by the patient) is not uncommon among psoriasis patients, accounting for 30-50% of the total cost, with an average of 2.2 work hours lost due to psoriasis. The limited information on such cost analysis justifies the need for future studies that address the cost of psoriasis therapies to provide the necessary transparency to guarantee reasonable medical care that considers the cost-benefit ratio and the best outcome for the patient’s quality of life.

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INTRODUCTION

The tasks of banking institutions have turned out to be more challenging as banking opPsoriasis is a chronic inflammatory skin disease that primarily affects the skin and joints. It is characterized by thickened, red areas of skin covered with silvery scales (Sampogna et al., 2006) (Stern, Nijsten, Feldman, Margolis, & Rolstad, 2004). Psoriasis occurs worldwide; affecting 2% to 4% of the global population or nearly 125 million people (Christophers, 2001). Approximately 6-30% of psoriasis patients developed psoriatic arthritis (Nijsten, Looman, & Stern, 2007). The treatments for psoriasis include topical therapy, phototherapy, systemic therapy, and biological therapies. Topical agents are indicated for mild psoriasis, whereas phototherapy is given to patients who have failed topical therapy, before starting them on systemic agents. Biologics should be offered to patients who have failed or are intolerant to conventional treatments and phototherapy (Medical Development Division, 2013). Psoriasis is a chronic disease, which contributes to the economic burden on patients and health care systems. Because of the chronic nature of psoriasis, patients need lifelong care (Radtko & Augustin, 2008; Raychaudhuri & Farber, 2001)

and this comes along with lifetime expenses. Because the treatment modalities are given in the hospitals as either inpatient or outpatient care, considerable travel cost and loss of time, productivity, and wage borne by the patients can be expected (Raho, Koleva, Garattini & Naldi, 2012; Meyer et al., 2010; Ghatnekar, Ljungberg, Wirestrand & Svensson, 2012). In recent years, newer drugs called biologics have surfaced for psoriasis management, highlighting the issue of the cost of therapy. These biologics have been found to be more effective than other modalities and can improve the patient’s quality of life (Sandoval, Pierce & Feldman, 2014). However, the higher costs associated with biologics may limit their use (Horn et al., 2007) to very severe cases, particularly in hospitals that are highly subsidized. Adverse events that are associated with the treatment courses accumulate the treatment cost because screening tests need to be done to identify those at risk of developing toxicity (Medical Development Division, 2013; Ahn, Gustafson, Sandoval, Davis & Feldman, 2013; Naldi & Griffiths, 2005). As an example, the most common side effect of an acitretin is hyperlipidemia, which may occur in up to 33% of people taking

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this drug. The use of antilipid agents, weight loss management, and a change in diet requires patients to spend more of their income to counter this effect (Hankin et al., 2005). Therefore, this paper was aimed to identify published studies reporting economic burden of psoriasis worldwide.

METHODOLOGY

A literature review of the PUBMED database was done during the period of Jun to October 2014 to review evidence concerning the economic burden of psoriasis. The search for literature with the use of the term “psoriasis” followed by “economic burden,” “direct cost,” or “indirect cost” produced 182 articles. Of the 182 articles identified, 46 duplicate articles were excluded making the total screened articles 86. After assessing full articles for eligibility, 19 studies were excluded because of not meeting inclusion criteria. Finally, 37 studies were included in the systematic review. To be included in the review, the article must be an observational study or a RCTs, must be published in the period 2000 to 2014, and must report on the direct and indirect costs of psoriasis. Articles that were not published in English were excluded.

RESULTS AND DISCUSSION

Numerous publications have reported on the economic burden of psoriasis on the patient, the health provider and the society. From the patients’ perspective, the economic burden can be seen in terms of the affordability of treatments; this impact is more severe among those with more severe disease and a lower family income (Beyer & Wolverson, 2010). The commonly cited costs associated with psoriasis are high insurance coverage, hospitalization cost, treatment cost, inpatient services, outpatient visits, drug prescriptions, cost of over-the-counter (OTC) drugs, loss of productivity, and time lost from work (Raho et al., 2012; Fowler et al., 2008; Javitz, Ward, Farber, Nail & Vallow, 2002; Schmitt & Ford, 2006). Among the components of the direct costs, hospitalization seems to be the most significant, accounting for 30% of the total expenses (Colombo, Di Matteo, Bruno, Girolomoni & Vena, 2012; Finzi, Mantovani & Belisari, 2001). Similarly, Mustonen et al. (2013) found that hospitalization cost represented 45% of the total economic burden of the patient. Costs associated with phototherapy accounted for 19% of the overall treatment cost, with travel cost and travel time representing more than 60%. Meanwhile, the cost of medications has been estimated to be around 20% of the total cost, amounting to an annual medication cost of €1,083 per patient. Among the therapies, topical drugs were the most frequently purchased by patients, accounting for 18% of the total medication costs. Biologics were purchased only by 5%

of patients, but they generated 67% of total medication costs. A cost analysis across western countries in 2004 revealed that the annual total direct and indirect costs borne by the US health care system because of psoriasis was US\$1.4 billion. Among European countries, the annual cost per patient was US\$15108 in Sweden, US\$10603 in Italy, US\$3632- 8494 in Germany, and US\$7117 in Canada (Feldman, Burudpakdee, Gala, Nanavaty & Mallya, 2014). Levy et al. (2012) evaluated the direct costs (resource utilization) and indirect costs (loss of productivity) borne by the Canadian health care system due to psoriasis, as well as the impact of the disease on patient’s quality of life. The results showed that the mean annual cost per patient was US\$7999 (95% CI: \$3563-\$12,434), with direct costs representing 57%. Meanwhile, loss of productivity accounted for 43% of the total cost, which was US\$3442 per patient.

Psoriasis also causes a considerable burden on the Hungarian health care system. Based on a cost analysis that compared two interventions, Biological Systemic Therapy (BST) and Traditional Systemic Therapy (TST), the mean annual cost per patient was US\$12,157, with direct costs as the most significant component, accounting for 86% of the total cost. There were variations in cost within the subgroup, with mean costs of US\$ 2768, US\$3026, and US\$19,996 for non-systemic therapy, traditional systemic therapy, and biological systemic therapy, respectively (Balogh et al., 2014). In Sweden, the total cost (outpatient visits and loss of productivity) associated with psoriasis showed a remarkable increase from US\$47.9 million in 2006 to US\$63.2 in 2009, whereas the total productivity loss decreased from US\$2727 to US\$ 223 million between 2006 and 2009 (Norlin, Steen Carlsson, Persson & Schmitt-Egenolf, 2014). A cost-of-illness analysis comparing inpatient and outpatient therapy in Germany revealed that the inpatient setting incurred higher direct, indirect, and annual costs per patient (US\$16,516) compared with the outpatient setting (US\$3779), with an increase of 104.3% for inpatient treatment. Treatment with biologics produced an overall higher cost compared with other modalities (Steinke, Wolfrum & Hoffmann, 2013). Another study in Germany reported an annual average cost of US\$1094 per patient, 60% of which was attributed to reimbursable preparation and 22% to inpatient services. Patients’ out-of-pocket expenses on nonprescription drugs amounted to US\$755 yearly and indirect costs to US\$1824 yearly, with an accrued total of US\$3630 per patient. The total cost for patients treated with systemic therapy was US\$6318 (Mu, 2006). The cost of psoriasis therapy borne by hospitals varied up to 20-fold due to the different treatment courses used (Carrascosa et al., 2006; Colombo et al., 2012; Berger, Ehlken, Kugland & Augustin, 2005).

A previous study comparing three intervention groups (topical, systemic, and high need) reported that the mean annual cost per patient was US\$8497. The highest cost was attributed to inpatient treatment (US\$2911), followed by medication costs (US\$2552), indirect costs (US\$1309), and out-of-pocket expenses (US\$1006). There were significant differences in costs between the three interventions; high need treatment generated the highest cost (US\$11,185), followed by systemic therapy (US\$9052) and topical therapy (US\$5177) (Radtke & Augustin, 2008). Although biologics are considered the most cost-effective treatment for psoriasis, biologic therapy causes a considerable economic burden on the Italian health care system, accounting for 13.7% of the pharmaceutical expenditure of the National Health Service. The finding estimated the direct cost of biologic therapy as US\$19803.30 yearly (Spandonaro et al., 2014). Comparing the costs of biological agents (etanercept and adalimumab) Ruano et al. (2013) found that there was no significant difference in the total cost per patient between etanercept and adalimumab (US\$18799 ± 7826 for etanercept versus US\$19,512 ± 11,541 for adalimumab). Larsen et al. (2013) who evaluated the cost of etanercept in the health care systems of Denmark and Norway found that the total annual cost increased from US\$13,259 to US\$48,617. However, the cost of outpatient care decreased from US\$1615 to US\$850, and that of loss of productivity from US\$5611 to US\$3061. The decrease in costs was noticeable in patients who had psoriatic arthritis. The largest increase in costs was reported during the first six months after receiving treatment.

As in other countries, psoriasis causes a significant economic burden in Asian countries. One study found that psoriasis patients used more health care services, medical resources, and drugs. Compared with non-psoriasis patients (NP), the total health care use was higher among psoriasis patients, US\$5529 compared with US\$3509 for NP; the medical cost for psoriasis patients was US\$3925 compared with US\$2687 for NP, whereas the drug cost was US\$1604 compared with US\$822, respectively. The disease severity greatly influences the cost of treatment. The total health care cost (US\$10,593 versus US\$5011), medical cost (US\$5854 versus US\$3728), and drug

cost (US\$4738 versus US\$1283) was higher among patients with moderate to severe psoriasis compared with those with mild psoriasis (Yu et al., 2009). A similar finding was reported by Chen et al. (2014) in Taiwan, with annual costs of US\$2002 and US\$816 for severe and mild psoriasis, respectively. The direct costs were reported to be US\$1366 and US\$488 for severe and mild psoriasis, respectively. For the indirect costs, such as loss of productivity, the total was US\$204 for severe psoriasis and US\$90 for moderate psoriasis. The breakdown of costs according to severity revealed that NHI-reimbursed cost was the most significant, accounting for 68% for moderate and 60% for mild psoriasis; out-of-pocket expenses accounted for 22% and 29%, respectively, whereas the productivity loss represented 10% and 11%, respectively.

An economic evaluation of psoriatic arthritis done in Hong Kong found that the average annual direct cost was US\$4,141 (in 2006) per patient. The inpatient cost was the most significant component, accounting for 27% of the direct cost, followed by outpatient visits (25%). The average indirect cost was approximately US\$3,127 yearly per patient, with 42% of patients reporting no indirect costs (Zhu et al., 2010).

CONCLUSION

Psoriasis contributes a considerable economic burden to patients around the world. The burden is comparable with that of other chronic illnesses, such as cancer and cardiovascular diseases. The costs of hospitalization and medication were the most significant components that contributed to the economic burden of patients. Loss of wage and productivity is not uncommon among psoriasis patients, accounting for more than half of the indirect costs. Most studies have reported that biologics treatment generates the highest cost among all treatment modalities. There is limited information on the economic evaluation of psoriasis, thus the need for a more comprehensive calculation of the cost of the disease. Future studies should address the cost of psoriasis therapies to provide the necessary transparency and guarantee reasonable medical care that considers the cost-benefit ratio and the best result for the patient's quality of life.

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