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An adverse events potential costs analysis based on Drug Programs in Poland. Dermatology focus

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ABSTRACT

The aim of the project, carried out within the Polish Society for Pharmacoeconomics (PTFE), was to estimate the potential costs of treatment of the side effects which (theoretically) may occur as a result of treatments for the selected diseases. This paper deals solely with dermatology related events. Herein, several Drug Programs financed by the National Health Fund in Poland, in 2012, were analyzed. The adverse events were selected based on the Summary of Product Characteristics of the chosen products. We focused the project on those potential adverse events which were defined in SPC as frequent and very frequent. The results are presented according to their therapeutic areas, and in this paper, the focus is upon that which is related to dermatology. The events described as 'very common' had an incidence of ≥ 1/10, and that which is 'common' – ≥ 1/100, <1 /10. In order to identify the resources used, we, with the engagement of clinical experts, performed a survey. In our work, we employed only the total direct costs incurred by the public payer, based on valid individual cost data in February 2014. Moreover, we calculated the total spending from the public payer's perspective, as well as the patient's perspective, and the percentage of each component of the total cost in detail. The paper, thus, informs the reader of the estimated costs of treatment of side effects related to the dermatologic symptoms and reactions. Based on our work, we can state that the treatment of skin adverse drug reactions generates a significant cost – one incurred by both the public payer and the patient.

INTRODUCTION

As part of the project, performed within the Polish Society for Pharmacoeconomics (PTFE), a Task Force group calculated the costs of dermatology related adverse events treatment. This Task Force is a group of PTFE members interested especially in the Drug Programs, one of the available options to allow patients to have access to innovative treatments.

In order to include a new medicinal product into the Drug Program, it is mandatory that a HTA analysis be performed for each reimbursement dossier submission [7,10]. The required HTA dossier has to include a cost-effectiveness and cost-utility analysis, demonstrating that the incremental cost utility ratio is below the threshold officially established by legal act [7,10]. The perspective for the pharmacoeconomical analysis should be the public payer perspective, and the analysis should take into account all potential direct costs. The PTFE task force group made an attempt to estimate the potential costs of treatment for the side effects which theoretically may occur as a result of treatment for the selected diseases. The first phase of the project was focused on a group of Drug Programs related to immune diseases (such as Rheumatoid arthritis, Psoriasis and Juvenile idiopathic arthritis). This paper's aim is to present the potential costs incurred by the public payer, as well as the patients in relation to treating dermatology related events.

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MATERIAL AND METHODS

Based on our analysis of a list of all Drug Programs financed by National Health Fund in Poland, in 2012, for the first phase of the project, we selected those Programs in which the same medicinal products were used. Those selected Programs were related to immunology: Rheumatoid arthritis, Psoriasis and Juvenile idiopathic arthritis. It is important to emphasise that for the adverse events costs analysis, it is not important which medicinal product was the causal agent of the adverse event. The important factors upon which we focused our efforts, were the treatment patterns to cure the patients who had experienced the adverse event. The adverse events selection was performed based on the Summary of Product Characteristics of the products used in the Drug Programs. All the adverse events listed in the SPCs and defined as 'common' and 'very common', were selected and grouped into therapeutic areas. We obtained a large number of adverse events related to the diverse therapeutic areas, and due to that reason, in this paper, we decided to present only the results related to dermatologic symptoms and reactions. The events described as 'very common' had an incidence of ≥ 1/10, and that which was 'common' – ≥ 1/100, <1 /10 [9].

In looking for published Polish therapeutic standards, we searched the internet databases and found publications related to dermatomycosis and to feet mycosis standards of treatment. Based on the data sourced from the aforementioned, we also calculated one episode treatment costs.

Following the methodology agreed upon within the Task Force group, we performed a survey, asking clinical specialists in dermatology for their expertise. This part of the project was based on a data collection with the use of a predefined questionnaire. The questionnaire aimed to collect experts' opinion on the standard treatment patterns. We collected data related to available medicinal products and all other resources used for the adverse event treatment (such as diagnostic procedures, ambulatory visits or hospitalization). The experts were asked to provide information about the doses, formulations used and time of treatment. With regards to diagnostic tests and ambulatory visits, information about the frequency was collected, and in case of hospitalization, information about the need and the length was gathered. The experts were re-contacted for data clarification after their returning the questionnaire. Of note, we performed the analysis of our gathered data with the cooperation of six dermatologists.

The final phase of our study was allocating cost to the employed identified resources. This analysis was done from public payer perspective. Additionally, we analyzed patient copayment to the treatment. The calculations took into account only the direct costs based on valid data in June 2014. We also used the information published on 23rd June 2014, by NHF, for hospitalization costs, diagnostic tests and ambulatory visits [6]. The analysis of the costs within ambulatory settings was based on the published reimbursement list of 23rd June 2014. Those published costs are considered valid as of July and August 2014 [12].

RESULTS

The aim of the project was to investigate the standard practice of clinicians when treating diverse adverse events which were identified as hypothetical within the Product SPCs. It was not our intention to assess the safety or efficacy of medicinal products used within the financed Drug Programs. Moreover, we did not focus the analysis on the relationship between the adverse event and the product used within the Program. Our objective was to allocate costs to the resources used for the adverse events treatment which we identified when performing the research by way of the use of a special questionnaire addressed to physicians. In our analysis, we used the NHF costs valid in July 2014 and the drug reimbursement costs incurred by public payer based on the data published in June 2014. The same source was used to calculate patients' copayment [12].

For the purpose of this analysis, in situations in which the doctor prescribed a medicinal product which is not reimbursed, we used the cost of the pharmaceuticals wholesalers' price lists valid from July 2014.

The clinical experts usually provided both names of the products used: the product name or the brand name, as well as the International Nonproprietary Name. If the most frequently used brand name product was not indicated, we included into our calculations, the least and the most expensive products available on the Polish market at the time of the analysis. Because of this, we presented the results as a range of values, with a maximum and minimum value. The analysis is based on direct medical costs calculation, including usage of resources such as pharmacotherapy, ambulatory visits to doctors and hospitalizations. In situations wherein the experts indicated that the same adverse event could be treated in both ambulatory and hospital settings, we presented the results for both scenarios, with and without hospitalization, and the hospitalization cost was calculated base on the scoring system used by the NHF in July 2014 [6].

All the results are presented in tables. Table 1 shows all the components included in the costs analysis. In it, we presented the direct costs incurred by public payer, with the minimum and maximum values for the treatment costs.

In Table 2, we compared the cost calculated according to both published standards and the experts' opinions. Based on the results of the analysis, it can be observed that the highest cost for the public payer was related to the in-hospital treatment of the adverse events (Table 1). These events are related to skin cancer (except melanoma, but including basal squamous cell carcinoma), and drug-induced toxic allergic dermatitis. Both events generated the highest cost for the payer. As a maximum, the calculated value was 2737.25 PLN and 1817.06 PLN respectively. The lowest cost from the public payer perspective was incurred due to onychoclasis (29.75 PLN per episode of treatment).

Table 1. The direct costs of adverse dermatologic events – from the public payer perspective

Adverse event		Public payer	
		Min. cost (PLN)	Max. cost (PLN)
Drug induced toxic-allergic dermatitis	no hospitalization required	63.98	101.06
	hospitalization required	1716.00	1817.06
Drug induced maculo-papular eruption (rash)		66.95	75.29
Skin infections	bacterial	80.06	98.24
	viral	65.67	108.90
	mycotic dermatitis, feet mycosis	89.25	
Impaired wound healing		59.50	
Onychoclasis		29.75	
Alopecia		59.50	
Dry skin		59.50	94.58
Skin cancer (excluding melanoma, including basal-squamous cell carcinoma)	without hospitalization	101.25	2113.25
	1-day hospitalization required	725.25	2737.25

Table 2. Dermatologic adverse events: pharmacotherapy costs – from the payer's perspective (NHF or patient) – ambulatory setting

Adverse event		NHF cost (PLN)	Patient cost (PLN)
Drug induced toxic-allergic dermatitis		4.48-40.69	6.25-145.02
Drug induced maculo-papular eruption (rash)		7.45-15.79	66.27-86.26
Skin infections	bacterial	20.56-38.74	38.54-124.11
	viral	6.17-49.40	27.32-100.50
	mycotic dermatitis, feet mycosis	0.00	35.42-106.26
Impaired wound healing		0.00	33.89-88.58
Onychoclasis		0.00	34.76-195.13
Alopecia		0.00	188.66-342.36
Dry skin		0.00-35.08	26.43-97.17
Skin cancer (excluding melanoma, including basal-squamous cell carcinoma)		0.00	162.19-391.18

When analyzing the pharmacotherapy costs incurred during treatment in an ambulatory setting, from public payer perspective, these were mostly generated by viral skin infections – 6.17-49.40 PLN, drug induced toxic allergic dermatitis – 4.48-40.69 PLN and bacterial skin infections – 20.56-38.74 PLN.

From the patient perspective, the costs that were considered significant (which were analyzed separately) were generated by skin cancer (except melanoma, but including basal squamous cell carcinoma) – 162.19-391.18 PLN, alopecia – 188.66-342.36 PLN, and onychoclasis – 34.76-195.13 PLN. The pharmacotherapy cost was not covered by NHF in none of these cases. When analyzing the adverse events treatment costs, the comparison between the experts' opinion and the published standards (based on dermatomycosis and feet mycosis treatments), we can observe that higher costs come about if standards are applied. These higher costs are related, from both public payer and patient-payer perspectives.

DISCUSSION

In order to validate our results, we searched the literature for a similar analysis having been performed in Poland or in some other country. In doing so, we found that there was a publication related to the economic burden of dermatologic toxicities, however, the analysis was focused on targeted cancer therapies [2]. In this study, the authors reviewed patients' medical records, and they calculated the costs to the patient for dermatologic toxicities related medications, clinic visits, laboratory and diagnostic testing, as well as therapeutic procedures. The finding was that for toxicity management, a median of three visits was required to a clinic, with a median cost of $1920 per patient. The highest cost was associated with hand/foot skin reactions ($968 per patient) and acneiform eruption ($933 per patient). The costs used were based on the Medicare Physician Fee Schedule for outpatient services, and for medication cost, the average wholesalers price as per Red Book 2008 was employed [2].

We also identified a study estimating a cost per adverse event treatment of around 2500 USD [1]. In cases of preventable events, the cost was higher, approximately 4600 USD per event [1]. Another study we found was published by Classen et al. In this, the authors estimated the additional hospitalization cost due to adverse event as 2013 USD [3].

What is more, the authors of a systematic review that we found, identified in relation to adverse events costs, the mean cost incurred by a patient in buying medication for managing cutaneous ADRs, in Nepal, being on average, 1.58 +/-1.41 USD. However, the calculation did not include the cost of hospitalizations or consultation [4].

In Poland, an assessment of adverse skin reactions was calculated and published by N. Wiśniewska [11]. This analysis was based on a retrospective review of hospital medical documentation of patients hospitalized due to adverse skin reactions. The analysis was done from the public payer perspective, and the most frequent forms of drug-induced skin reactions, diagnosed in the study group, included toxic-allergic dermatitis – 52%, multiform erythema – 21%, nodal erythema – 15% and the Stevens-Johnson Syndrome (SJS) – 4%. The total cost of hospitalisation, based on the scores assigned by the National Health Fund and resulting from the Act on medical services, and financed from the public funds, amounted to 117 717 EUR in the analysed group. The average cost per patient was 717 EUR,while the same cost from the hospital's perspective was 680 EUR [11].

Moreover, the diagnosis related group J38 includes toxic-allergic dermatitis, and for the group of patients with severe dermatologic diseases, the overall direct cost was evaluated and amounted to a total sum of 82 444 euro. The average costs for this patients came to 972 euros [11].

During our search, we also found a paper by J. Stausberg and J. Hasford. They analyzed the German database built upon the DRG system. In their work, focused on adverse drug events, they have included about 48 million hospital episodes. From the period 2003-2006, they extracted hospital episodes recorded with the G-DRG system, and the result was that 5% of the hospital admissions were at least possibly drug related, and 0.7% were very likely drug-induced. These authors, however, did not focus their analysis on the costs aspect [8].

In the United States, P. Koelblinger et al. analyzed, in outpatient settings, the causes of cutaneous adverse events.

They based their research on the National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS) from the period between 1995 and 2005. In their analysis, the authors found that the annual incidence of cutaneous adverse event was 2.26 per 1,000 persons, and that the patients were treated with an average of 2.2 medications (in addition to the one that caused the adverse reaction). They noted that these mediations were for the most part, antimicrobial agents, and the most frequently reported skin reactions were dermatitis and urticaria. However, the authors did not include the costs of the identified skin reactions in the scope of their research [5].

CONCLUSIONS

Based on the analyzed data, we can observe a significant patient contribution to the adverse events treatment cost in relation to dermatologic diseases and symptoms. Often, patients have to pay out of their own pocket for the whole pharmacotherapy prescribed for the adverse events treatment. The costs generated by the adverse events, for the public payer, are also high, especially in situations in which hospitalization is required

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