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ARTYKUŁ ORYGINALNY / *ORIGINAL ARTICLE*

Direct healthcare costs and cost-effectiveness of acute coronary syndrome secondary prevention with ticagrelor compared to clopidogrel: economic evaluation from the public payer's perspective in Poland based on the PLATO trial results

Justyna Pawęska[1], Tomasz Macioch[1], Piotr Perkowski[2], Andrzej Budaj[3], Maciej Niewada[4]

[1]HealthQuest Sp. z o.o. Sp.k., Warsaw, Poland
[2]AstraZeneca Pharma Poland Sp. z o.o., Warsaw, Poland
[3]Department of Cardiology, Postgraduate Medical School, Grochowski Hospital, Warsaw, Poland
[4]Department of Experimental and Clinical Pharmacology, Medical University of Warsaw, Warsaw, Poland

Abstract

Background: Ticagrelor is the first reversibly binding oral P2Y12 receptor antagonist designed to reduce clinical thrombotic events in patients with acute coronary syndrome (ACS). Compared to clopidogrel, ticagrelor has been proven to significantly reduce the rate of death from vascular causes, myocardial infarction (MI), or stroke without an increase in the rate of overall major bleeding in patients who have an ACS with or without ST-segment elevation (STEMI and NSTEMI) or unstable angina (UA).

Aim: To evaluate the cost-effectiveness and healthcare costs associated with secondary prevention of ACS using ticagrelor or clopidogrel in patients after STEMI, NSTEMI and UA.

Methods: An economic model based on results from the PLATO trial was used to evaluate the cost-effectiveness of one-year therapy with ticagrelor or clopidogrel. The structure of the model consisted of two parts, i.e. the decision tree with one-year PLATO results and the Markov model with lifelong estimations, which exceeded PLATO follow-up data. The model was adjusted to Polish settings with country-specific data on death rates in the general population and direct medical costs calculated from the public payer's perspective. Costs were derived from the National Health Fund (NHF) and the Ministry of Health and presented in PLN 2013 values. Annual mean costs of second and subsequent years after stroke or MI were obtained from the literature. Uncertainty of assumed parameters was tested in scenarios and probabilistic sensitivity analyses. The adopted model allowed the estimation of an incremental cost-effectiveness ratio for life years gained (LYG) and an incremental cost-utility ratio for quality adjusted life years (QALY).

Results: Total direct medical costs to the public payer at a one year horizon were 2,905 PLN higher with ticagrelor than with clopidogrel. However, mean healthcare costs at a one year horizon (excluding drug costs and concomitant drugs) were 690 PLN higher for patients treated with clopidogrel. In a lifetime horizon, results indicated that ticagrelor was the more cost-effective option compared to generic clopidogrel, with an incremental cost per LYG estimated at 21,566 PLN and an incremental cost per QALY estimated at 24,965 PLN.

Conclusions: In a lifetime horizon, which should be used when comparing technologies with different impacts on mortality, cost-effectiveness evaluation resulted in more favourable economic outcomes for ticagrelor than for generic clopidogrel, with the cost per QALY well below the recommended willingness to pay threshold in Poland (24,965 PLN vs. 111,381 PLN).

Key words: acute coronary syndrome, costs, PLATO trial, health economics

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Address for correspondence:
MSc Justyna Pawęska, HealthQuest Sp. z o.o. Sp.k., ul. Mickiewicza 63, 01–625 Warszawa, Poland, e-mail: justyna.paweska@healthquest.pl
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INTRODUCTION

Cardiovascular disease (CVD) is the major cause of death in industrialised countries [1]. Coronary artery disease is in turn the most prevalent sign of CVD and its clinical presentations encompass inter alia unstable angina (UA), myocardial infarction (MI) and sudden death. Regardless of improvements in treatment, deaths after acute coronary syndrome (ACS) are still a major concern [2]. Data from the literature indicates that the annual incidence of ACS in Poland ranges from around 100,000 to 250,000 cases, wherein the number of 100,000–150,000 of hospitalised patients per year is reported in the majority of publications which is also consistent with the National Health Fund (NHF) statistics reporting 134,483 ACS hospitalisations in 2012 [3–5]. Euro Heart project data indicates that in Poland in 2009, age standardised death rates due to coronary heart disease among adults under the age of 65 years were 46 and 10 per 100,000 males and females, respectively [6].

According to the European Society of Cardiology (ESC) recommendations, antiplatelet agents combined with acetylsalicylic acid should be considered as the basis of ACS preventive treatment [7]. Ticagrelor is the first available direct acting, reversibly binding oral P2Y12 receptor antagonist, shown to reduce clinical thrombotic events in patients with ACS [8, 9]. The efficacy and safety of ticagrelor were proved in the PLATelet inhibition and patient Outcomes (PLATO) trial — a large, international, multi-centre, double-blind, randomised trial with 18,624 ACS patients [10]. At 12 months, the PLATO trial showed significant differences in favour of ticagrelor for the primary and secondary composite end-points as well in the rates of MI, death from any cause, and death from vascular causes. The primary end-point (a composite of death from vascular causes, MI, or stroke) was reported to be 9.8% of ticagrelor treated patients compared to 11.7% of those receiving clopidogrel (HR = 0.84; 95% CI 0.77–0.92; $p < 0.001$).

Since decision makers need to consider the cost associated with various strategies of treatment when prioritising scarce health resources, the aim of this analysis was to estimate the cost-effectiveness of ticagrelor compared to clopidogrel from the perspective of the healthcare payer in Poland [11, 12].

METHODS

This analysis was conducted based on the economic model adapted to Polish settings. The model has been validated and published [13]. The structure of the model consisted of two parts, i.e. a decision tree regarding first year of treatment and based on individual patient data from the PLATO study and a subsequent Markov model extrapolating data over a one-year time horizon of the PLATO trial. Over the follow-up period of the PLATO trial, the Markov model was populated with data from other sources, i.e. Polish national data on mortality rate in the general population over the age of 40, Swedish data on the risk of death due to CVD, as specific local data was not available, and Polish data on direct medical costs

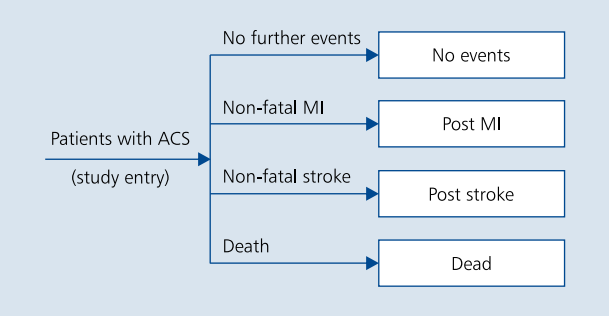

Figure 1. The structure of the decision tree; ACS — acute coronary syndrome; MI — myocardial infarction

Table 1. Health states in the model with probabilities of its occurrence based on the PLATO trial

Health state	Clopidogrel (n = 9,291)	Ticagrelor (n = 9,333)
No event	8,226 (88.54%)	8,432 (90.35%)
Myocardial infarction	485 (5.22%)	421 (4.51%)
Stroke	74 (0.80%)	81 (0.87%)
Death due to cardiovascular disease	442 (4.76%)	252 (3.78%)
Death due to reasons other than cardiovascular	64 (0.69%)	46 (0.49%)

to the public payer, i.e. the NHF. The starting age in the model was 62 so as to be compliant with the mean age of patients participating in the PLATO trial. As Markov cohort simulations consider a hypothetical cohort of patients included in the decision process, the baseline characteristics of that cohort should resemble the clinical trial population. Since a lifetime horizon was adopted, costs and effects were discounted with the rates of 5% for costs and 3.5% for effects in accordance with the guidelines of the Polish Agency for Health Technology Assessment [14]. To evaluate the cost-effectiveness of ticagrelor, a recommended willingness to pay threshold, set at an amount of three times the gross domestic product per capita, was used (111,381 PLN) [15, 16].

Decision tree

The structure of the decision tree was based on endpoints assessed during the PLATO trial, i.e. death due to CVD, MI and stroke so that data analysis encompassed all events (including haemorrhagic complications) which occurred during a one-year follow-up of the PLATO trial (Fig. 1).

Results from the PLATO trial describing proportions of patients who experienced defined events (corresponding to states of the model) are shown in Table 1.

One-year probabilities of these events in the decision tree were estimated from survival analysis with Weibull distribution

Table 2. Transition probabilities used in the decision tree

Health state	Clopidogrel	Ticagrelor
No event	0.875	0.895
Myocardial infarction	0.058	0.050
Stroke	0.009	0.010
Death	0.059	0.046

Table 3. Mean utility values during the PLATO trial dependent on health state and used drug — the decision tree parameters

Health state	Ticagrelor	Clopidogrel	Difference
No event	0.8732	0.8763	–0.003
Myocardial infarction	0.8106	0.8136	–0.003
Stroke	0.7349	0.7379	–0.003
Death	0.2473	0.2503	–0.003

and further transformations of gained equations and parameters, and the results are presented in Table 2.

Quality of life was also estimated based on results from the PLATO trial. Utilities values were obtained from each patient after six and 12 months of follow-up with a EQ-5D questionnaire and then used to estimate mean utility values for patients in each state. Utility values of the health states used in the decision tree are presented in Table 3.

Markov model

The Markov model was a logical sequel of the decision tree — its structure is shown in Figure 2. Each cycle lasted one year and patients went through the states in accordance with assumed probabilities of a transition to a particular health state (Fig. 2).

To obtain probabilities of transition to the states 'non-fatal MI' and 'non-fatal stroke' in the Markov model, the results of the one-year follow-up of the PLATO trial were extrapolated using survival analysis with Weibull distribution. The extrapolation was made with a conservative assumption that there was no treatment effect after the study ended (second and subsequent years of the model). Survival in the 'no event' state and after non-fatal events was modelled as an increase of hazard of death, due to events defined in the model, compared to death rates in the Polish general population, using the formula: $p = 1 - e^{(-r \times HR)}$, where p was the annual probability of death in the model, r indicated the rates of death in the general population, and HR was the assumed specific hazard ratio after an event. Hazard ratios for the patients in the following states: 'no event', 'non-fatal MI', 'non-fatal stroke', 'post MI' and 'post stroke' were based on Swedish data implemented into the model. Data on death rates in the Polish general population was obtained from life tables available at the Polish Central Statistical Office database [17].

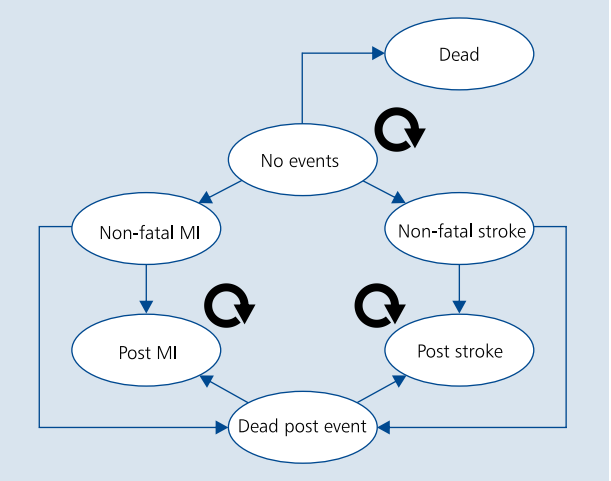

Figure 2. Markov model; MI — myocardial infarction

Quality of life was assessed as follows. For the state 'no event', a utility value specific for patients with no cardiovascular events during the PLATO trial was used (the same as in the decision tree; Table 3). This approach seems to be conservative since a possible improvement of quality of life in subsequent years after ACS was not considered in the model, and consequently further decrements in the quality of life due to ageing were implemented. For the 'non-fatal MI' and 'non-fatal stroke' states, utility values decrements from the PLATO trial were averaged from groups of patients receiving ticagrelor or clopidogrel. Thus for 'non-fatal MI', a utility value decrement of 0.0627 and for 'non-fatal stroke', a utility value decrement of 0.1384 was used. Patients in the states 'post MI' and 'post stroke' had the same decrements in utility.

Costs

Costs were estimated based on resource use obtained from the PLATO trial (Table 4), and unit costs of procedures and services were compliant with the perspective of NHF as the public payer in Poland [18]. All costs are presented in PLN, 2013 values. Unit costs and resource use were implemented into the decision tree to compute annual cost per patient in a particular health state in this initial part of the model. Cost results from the decision tree regarding first year after MI or stroke, reported in Table 5, were averaged for patients receiving ticagrelor and those receiving clopidogrel, and then adapted to the Markov model for states 'non-fatal MI' and 'non-fatal stroke'. Costs of second and subsequent years after MI or stroke, in the 'post MI' and 'post-stroke' states, were based on the study EUROASPIRE III and adjusted to 2013 values with Consumer Price Index for health using data from the Polish Central Statistical Office [19, 20]. As uncertainty was entailed with all the assumptions, default values used in the model base case analysis were tested in a scenario and probabilistic sensitivity analyses (Table 4, Table 5).

Table 4. Mean resource use per patient for selected resources — the PLATO trial results

Resource use item	Clopidogrel (n = 9,291)	Ticagrelor (n = 9,333)	Difference
Bed days	12.42	12.21	0.21
Stress test	0.24	0.24	0.00
Echocardiography	0.95	0.95	0.01
Coronary angiography	1.04	1.02	0.02
Other investigations	0.20	0.21	–0.01
PCI	0.78	0.76	0.01
Bare metal stent	0.68	0.66	0.02
Drug-eluting stent	0.37	0.34	0.02
CABG	0.10	0.10	0.00
Other interventions	0.04	0.04	0.00
Units of blood products	0.54	0.54	0.01

CABG — coronary artery bypass grafting; PCI — percutaneous coronary intervention

Table 5. Daily costs (PLN) of ticagrelor (180 mg) and clopidogrel (75 mg) obtained from the decision tree costs (PLN) of health states

Cost item	Ticagrelor (PLN)	Clopidogrel (PLN)	Difference (PLN)
Drug	10.86	0.66	10.20
Health state (decision tree):			
No event	14,960	15,474	–514
Myocardial infarction	30,020	28,725	1,295
Stroke	22,109	26,066	–3,957
Death	19,768	22,340	–2,572

Table 7. Costs (PLN) of health states — lifetime results of the Markov model

Health state	Ticagrelor (PLN)	Clopidogrel (PLN)	Difference (PLN)
Drug cost	3,872	235	3,637
No event (ACS related)	14,956	15,081	–126
MI related	9,453	9,704	–251
Stroke related	2,459	2,388	71
Death related	914	1,308	–394
Total	**31,654**	**28,716**	**2,938**

ACS — acute coronary syndrome; MI — myocardial infarction

RESULTS

Mean healthcare costs (excluding drug costs and concomitant drugs) estimated in the decision tree (one year horizon) on the basis of the PLATO trial results and unit costs from the NHF perspective were 690 PLN higher for patients treated with clopidogrel (Table 6), than for patients treated with ticagrelor.

The key drivers of the difference in healthcare cost were the differences in interventions (451 PLN) and bed days (218 PLN). Only costs related to bleeding were slightly higher for patients treated with ticagrelor. The Markov model estimations indicated that total costs of treatment with ticagrelor were higher compared to clopidogrel due to drug costs and the differences were estimated at 2,905 PLN per patient in the first year of therapy and at 2,938 PLN in the lifetime horizon — for details see Table 7. The lifetime model resulted in incremental life years gained (LYG) of 0.136 and incremental quality adjusted life years (QALY) of 0.118 in favour of ticagrelor. Costs per additional LYG and QALY in the lifetime model were estimated at 21,566 PLN and 24,965 PLN respectively when ticagrelor was used instead of clopidogrel. Analysis of subgroups of patients with UA, STEMI, NSTEMI and patients with planned invasive management resulted in the following incremental

Table 6. Mean healthcare costs (excluding drug costs and concomitant drugs) and key cost components by treatment group and time period estimated on the basis of data on resource use from the PLATO trial and Polish unit costs

Cost item	Index hospitalisation		After index hospitalisation		Total study period		
	Ticagrelor (PLN)	Clopidogrel (PLN)	Ticagrelor (PLN)	Clopidogrel (PLN)	Ticagrelor (PLN)	Clopidogrel (PLN)	Difference (PLN)
Bed days hospitalisations	1,643	1,655	1,593	1,799	3,236	3,454	–218
Examinations	1,415	1,433	441	447	1,856	1,880	–24
Interventions	7,904	8,154	2,702	2,903	10,606	11,057	–451
Bleeding related	187	196	121	109	308	305	3
Total	**11,150**	**11,438**	**4,856**	**5,258**	**16,006**	**16,696**	**–690**

Table 8. Life-time results from Markov model regarding therapy with ticagrelor vs. clopidogrel in patients with acute coronary syndrome (ACS) in Poland

	Ticagrelor	Clopidogrel	Incremental	ICER
All ACS				
Costs (PLN)	31,654	28,716	2,938	
Life-years	10.27	10.13	0.14	21,566
QALYs	8.67	8.56	0.12	24,965
Unstable angina				
Costs (PLN)	30,272	27,280	2,992	
Life-years	10.41	10.30	0.11	26,113
QALYs	8.66	8.56	0.10	31,306
Non STEMI				
Costs (PLN)	34,456	31,513	2,944	
Life-years	10.15	10.01	0.14	21,003
QALYs	8.37	8.25	0.12	24,408
STEMI				
Costs (PLN)	29,260	26,328	2,932	
Life-years	10.39	10.25	0.13	22,423
QALYs	9.08	8.96	0.11	25,658
Planned invasive management				
Costs (PLN)	30,733	27,790	2,943	
Life-years	10.38	10.26	0.12	24,916
QALYs	8.91	8.80	0.10	28,593

ICER — incremental cost-effectiveness ratio; STEMI — ST elevation myocardial infarction; QALY — quality adjusted life years

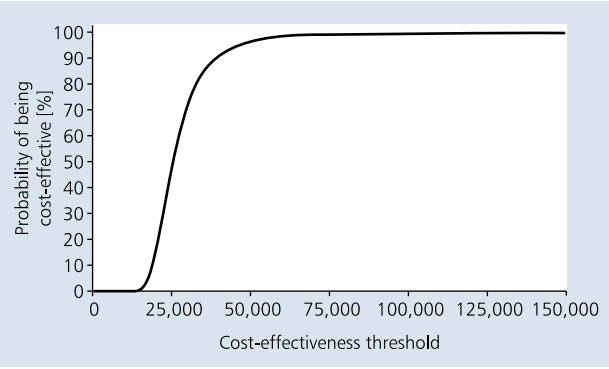

Figure 3. Cost-effectiveness acceptability curve for ticagrelor

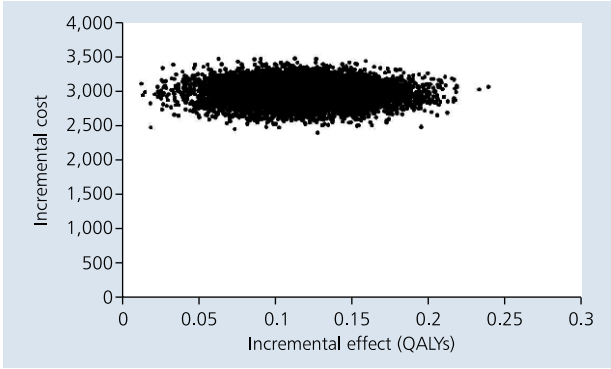

Figure 4. Results from the probabilistic sensitivity analysis on the cost-effectiveness plane

cost-effectiveness ratio for QALYs in the lifetime horizon: for patients with UA, cost per additional QALY was estimated at 31,306 PLN; for patients with NSTEMI — 24,408 PLN; for patients with STEMI — 25,658 PLN; and for patients with planned invasive management — 28,593 PLN (Table 8).

The scenario analysis indicated that the cost-effectiveness of ticagrelor was consistent across the investigated subgroups. Results of the probabilistic sensitivity analysis also proved the robustness of the base-case results (Figs. 3, 4).

DISCUSSION

According to the ESC recommendations from 2012 [7] in a case of acute MI with ST-segment elevation, dual antiplatelet therapy using aspirin combined with ticagrelor or prasugrel is recommended for patients undergoing primary percutaneous coronary intervention. Clopidogrel can be used if both ticagrelor and prasugrel are either not available or contraindicated. For long term therapy after STEMI, ticagrelor, clopidogrel or prasugrel should be used with aspirin for up to 12 months,

regardless of previous reperfusion therapy. In accordance with the ESC recommendations from 2011 [1] in a case of ACS without ST-segment elevation, patients with no contraindications should be given aspirin combined with a P2Y12 inhibitor as soon as possible and over a period of 12 months. Ticagrelor is recommended for all patients at moderate or even higher risk of ischaemic events independently from an initial strategy of treatment. Clopidogrel is recommended if ticagrelor or prasugrel cannot be given. After coronary artery bypass grafting surgery, ticagrelor or clopidogrel should be (re-)started as soon as considered safe.

The analysis was based on the PLATO trial which showed that ticagrelor plus aspirin reduced the risk of MI, stroke or death from vascular causes without a significant increase in major bleeding but with an increase in the rate of non-procedure-related bleeding compared to clopidogrel. We aimed to evaluate the cost-effectiveness of secondary prevention of patients with ACS using ticagrelor compared to generic clopidogrel. Our results indicated that ticagrelor was a better option than clopidogrel, regardless of higher drug acquisition costs. As indicated in Table 6, costs associated with hospitalisations, follow-up and interventions were higher for patients treated with clopidogrel compared to those treated with ticagrelor. The key drivers of the difference in total healthcare cost were the differences in the cost of interventions observed at index and after index hospitalisation and the cost of bed days observed mainly after index hospitalisation. Moreover, there was a high probability that the cost-effectiveness of therapy with ticagrelor would not exceed the willingness to pay threshold in Poland in a lifetime horizon. Also analysis conducted for subgroups of patients with UA, NSTEMI, STEMI and patients with planned invasive management proved the cost-effectiveness of ticagrelor.

This analysis was performed from the public payer's perspective since in Poland costs due to ACS are mainly associated with hospital services paid by the NHF. However, costs to society generated by ACS might be of huge importance. As shown by data from the EuroHeart II project [6], indirect costs due to coronary heart disease mortality and morbidity in Poland in 2009 were 424,684,000 EUR and 181,603,000 EUR respectively.

Limitations of the study

The main limitation of our analysis was associated with using Swedish data on increased mortality risks due to MI, stroke or UA. However, when there is a lack of country specific data, using data from another country is acceptable in economic analysis especially if the data comes from the same region. We also did not identify Polish specific data on costs of patients after MI or stroke in second and consecutive years after the index event. Yet the model allowed us to compare both treatment options regardless of implemented parameters, which were the same for both ticagrelor and clopidogrel. This means that results presented as increments showed reliable differences between ticagrelor and clopidogrel. Other limitations of the analysis are adopted utility values. In the model, utilities were calculated using standardised utility values for the United Kingdom general population. This was due to the fact that only cumulative EQ-5D data was available and because of that we did not estimate quality of life based on standardised utility values for the Polish general population. Although resource use derived from the PLATO trial was used in the model instead of real life data, it should be pointed out that Polish patients in the PLATO trial constituted 14.31% of the total population, thus we believe specific data on local clinical practice and corresponding resource use are fairly well represented.

Treatment with ticagrelor was associated with an improvement of quality adjusted survival, and in a lifetime horizon indicated that ticagrelor was a cost-effective option compared to generic clopidogrel. Furthermore, an improvement in QALY under a lifetime model indicated that patients treated with ticagrelor had better health than those treated with clopidogrel.

The Agency for Health Technology Assessment in Poland found ticagrelor to be a cost-effective intervention in cardiovascular prevention and recommended its reimbursement following a reduction of cost to the healthcare system [21]. Our findings also confirmed previous publications from Germany and Singapore, which showed ticagrelor to be a cost-effective option compared to clopidogrel [22, 23].

CONCLUSIONS

Our analysis has shown that ticagrelor is cost-effective from a Polish healthcare perspective compared to generic clopidogrel. The cost per QALY is well below the recommended willingness to pay threshold set by the Polish Agency of Health Technology Assessment. This result is primarily driven by the mortality benefit observed in PLATO.

Despite the higher overall cost of one-year treatment with ticagrelor compared to generic clopidogrel, this analysis has shown a significant reduction in costs generated by hospitalisations, follow-up and interventions.

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Bezpośrednie koszty medyczne i efektywność kosztowa tikagreloru w porównaniu z klopidogrelem w prewencji wtórnej ostrych zespołów wieńcowych: ocena ekonomiczna z punktu widzenia polskiego płatnika publicznego na podstawie wyników badania PLATO

Justyna Pawęska[1], Tomasz Macioch[1], Piotr Perkowski[2], Andrzej Budaj[3], Maciej Niewada[4]

[1]HealthQuest Sp. z o.o. Sp.k., Warszawa; [2]AstraZeneca Pharma Poland Sp. z o.o., Warszawa; [3]Klinika Kardiologii, Centrum Medycznego Kształcenia Podyplomowego, Szpital Grochowski, Warszawa; [4]Katedra i Zakład Farmakologii Doświadczalnej i Klinicznej, Warszawski Uniwersytet Medyczny, Warszawa

Streszczenie

Wstęp: Tikagrelor jest pierwszym selektywnym i odwracalnym antagonistą receptora P2Y12, opracowanym w celu zmniejszenia liczby zdarzeń niedokrwiennych u pacjentów z ostrym zespołem wieńcowym (ACS). Wyniki międzynarodowego, randomizowanego badania PLATO, które objęło populację chorych z ACS z uniesieniem odcinka ST (STEMI) i bez uniesienia odcinka ST (NSTEMI) oraz niestabilną dławicą piersiową (UA), wykazały, że w porównaniu z klopidogrelem, tikagrelor istotnie zmniejsza ryzyko wystąpienia pierwszorzędowego złożonego punktu końcowego [zgon z przyczyn naczyniowych, zawał serca (MI) lub udar], a także wpływa na zmniejszenie ryzyka zgonów z powodów naczyniowych oraz MI analizowanych odrębnie. Jednocześnie w grupie otrzymujących tikagrelor nie zaobserwowano wzrostu ryzyka poważnych krwawień, a analiza bezpieczeństwa wykazała brak istotnych różnic między porównywanymi lekami w zakresie większości istotnych klinicznie działań niepożądanych. Tikagrelor w skojarzeniu z kwasem acetylosalicylowym jest wskazany jako opcja terapeutyczna przez Europejskie Towarzystwo Kardiologiczne w zapobieganiu zdarzeniom sercowo-naczyniowym u dorosłych chorych z ACS (STEMI, NSTEMI i UA).

Cel: Celem pracy była ocena tikagreloru, stosowanego w prewencji wtórnej ACS (STEMI, NSTEMI i UA), pod względem efektywności i użyteczności kosztowej oraz jego wpływu na bezpośrednie koszty opieki zdrowotnej w porównaniu z klopidogrelem.

Metody: Analizę przeprowadzono na podstawie zaadoptowanego do warunków polskich modelu ekonomicznego, złożonego z dwóch części. Pierwszą stanowiło drzewo decyzyjne, które objęło pierwszy rok leczenia i w którym wykorzystano wyniki badania PLATO, a drugą — model Markowa, będący logiczną kontynuacją drzewa decyzyjnego, w którym dokonano ekstrapolacji danych wykraczających poza roczny horyzont analizy badania PLATO. Model został dostosowany do warunków polskich w zakresie danych kosztowych (bezpośrednie koszty medyczne) oraz tablic trwania życia (dane GUS). Dane dotyczące kosztów jednostkowych, aktualne na rok 2013, identyfikowano na podstawie katalogów świadczeń, wyceny punktów rozliczeniowych opartych na kontraktach Narodowego Funduszu Zdrowia (NFZ) oraz wykazu leków refundowanych Ministerstwa Zdrowia i przedstawiono w polskich złotych (PLN). Średnie roczne koszty drugiego roku i kolejnych lat po udarze lub MI zaczerpnięto z literatury. Analizę przeprowadzono z perspektywy płatnika publicznego (NFZ), w dożywotnim horyzoncie czasowym. Niepewność poszczególnych parametrów modelu testowano w jednoczynnikowej, wieloczynnikowej i probabilistycznej analizie wrażliwości. Model ekonomiczny umożliwił oszacowanie kosztów oraz wyników zdrowotnych, tj. zyskanych lat życia (LYG) i zyskanych lat życia skorygowanych o jakość (QALY) oraz inkrementalnego współczynnika kosztów-efektywności (ICER) i inkrementalnego współczynnika kosztów-użyteczności (ICUR).

Wyniki: Średnie całkowite roczne koszty medyczne ponoszone przez płatnika publicznego podczas terapii tikagrelorem były wyższe o 2905 PLN w porównaniu z terapią klopidogrelem. Natomiast średni roczny koszt opieki zdrowotnej bez uwzględnienia kosztów leków był o 690 PLN wyższy w grupie otrzymujących klopidogrel. W horyzoncie dożywotnim analiza wykazała, że tikagrelor jest opcją kosztowo-efektywną w porównaniu z generycznym klopidogrelem. Wartość ICER oszacowano na 21 566 PLN/LYG, a ICUR — na 24 965 PLN/QALY. Analiza wrażliwości wykazała, że żaden z parametrów analizowanych w szerokim zakresie zmienności nie wpłynął w sposób istotny na końcowe wyniki analizy wskazujące na wysoką efektywność kosztową zastosowania tikagreloru w leczeniu ACS.

Wnioski: Wyniki analizy w dożywotnim horyzoncie czasowym, który zgodnie z wytycznymi Agencji Oceny Technologii Medycznych, jest właściwy, gdy porównuje się leki o różnym wpływie na śmiertelność, wykazały, że w populacji chorych z ACS, 12-miesięczna terapia z zastosowaniem tikagreloru jest postępowaniem kosztowo-efektywnym w porównaniu z 12-miesięczną terapią z zastosowaniem generycznego klopidogrelu. Oszacowana wartość ICUR znalazła się znacznie poniżej rekomendowanego w Polsce progu opłacalności, tj. 3-krotnej wartości produktu krajowego brutto *per capita* (24 965 PLN *vs*. 111 381 PLN). Największy wpływ na wyniki miała, wykazana w przypadku tikagreloru, istotna redukcja ryzyka zgonu w porównaniu z klopidogrelem.

Słowa kluczowe: ostre zespoły wieńcowe, badanie PLATO, koszty, analiza kosztów-użyteczności, analiza kosztów-efektywności

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Adres do korespondencji:
Justyna Pawęska, HealthQuest Sp. z o.o. Sp.k., ul. Mickiewicza 63, 01–625 Warszawa, e-mail: justyna.paweska@healthquest.pl
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