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Acute and Remote Thrombotic Complications in Patients with Implanted Drug-eluting Stents; Influence of Smoking as a Risk Factor

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STOJANOVIĆ ET AL: Acute and Remote Thrombotic Complications in Patients with Implanted Drug-eluting Stents; Influence of Smoking as a Risk Factor. The use of percutaneous coronary intervention (PCI) with the procedural success and continuous technological improvements contributed to a better treatment of coronary heart disease also resulted in the development of acute and remote thrombotic complications. Environmental factors such as smoking significantly worsen unwanted cardiac events after percutaneous coronary intervention. The aim of this study was to determine the influence of risk factors (smoking) the number and severity of adverse cardiac events and its possible selective effect on the formation of acute and subacute thrombotic complications during the application of stents coated with paclitaxel (PES) and sirolimus-coated stents (SES). The study was based on a five-year follow-up of all consecutive patients at the Institute for Cardiovascular Diseases Dedinje in which are embedded drug-eluting stents with sirolimus (Cyphar) and paclitaxel (Taxus). Average age of the tested population was 68.4±8.4 years, of which 585 patients were men (83.4%) and 116 (16.6%) women. Four patients (0.6%) died. Myocardial infarction occurred in nine patients (1.3%). The overall incidence of MACE events was 14.5%, which was registered in 102 patients. Stent thrombosis, definite criteria according to ARC, occurred in 22 patients (3.14%). Probable stent thrombosis was observed in 1 patient (0.14%), possible stent thrombosis in 1 patient (0.14%). Sirolimus and paclitaxel-coated stents are safe and effective means of percutaneous coronary interventions conducted for treatment of atherosclerotic coronary artery disease. Research has shown a large impact of smoking as a risk factor in the development of adverse cardiac events. (J HK Coll Cardiol 2019;27:1-10)

Coronary artery disease, Paclitaxel, Sirolimus, Smoking

摘要
經皮冠狀動脈介入治療（PCI）使用成功及持續的技術改進，有助於更好地治療冠狀動脈疾病的同時，也可導致急性及遠端血栓性併發症的發展。諸如吸煙等環境因素在經皮冠狀動脈介入治療後，會嚴重惡化了不必要的心臟事件。本研究的目的是確定風險因素（吸煙）對心臟不良事件的數量和影響的嚴重程度，以及使用紫杉醇塗層支架（PES）和西羅莫司塗層支架（SES）的應用過程中對急性及亞急性血栓併發症形成的可能影響。此項研究基於對Dedinje心血管病研究所患者連續5年的隨訪，患者皆有植入藥物塗層支架，包括西羅莫司（Cyphar）及紫杉醇塗層支架。根據結果，本研究發現，吸煙作為一種重要風險因素，對降低不良事件和改善預後具有顯著影響。

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Introduction

The use of percutaneous coronary intervention (PCI) for the treatment of coronary ischemic disease experienced a dramatic expansion in the past two decades. At the same time, procedural success, safety and durability PCI dramatically improved due to continuous technological improvements, the periprocedure prepare patients and better understanding early and late complications of treatment. These improvements support the expansive use of PCI as definitive therapy.1,2

Application of stents still has the effect of two potentially very significant complications, such as stent thrombosis and restenosis at the site of installation. Therefore, attempts to create stents that will be less thrombogenic and that will cause less inflammatory reaction, and reduce the aforementioned complications to a minimum. Stents coated with biocompatible materials are not significantly reduce major adverse cardiac events. Unlike biocompatible stents, stents with sirolimus and paclitaxel have proved to be very effective in reducing unwanted cardiac events.3,4

Smoking is one of the major risks of coronary artery disease. It is known that the risk of coronary heart disease is twice as high in smokers. It is believed that nicotine increases the mortality rate in patients with coronary artery disease by about 30%. The attacks of angina are more common in smokers in about 3 times, and last about 12 times longer. This is due to the increase in pulse rate and blood flow resistance which burdens the heart muscle. In a country where 40% of the population smokes and how this needs to warn of this danger. One should know that smoking is a sign unenlightenement and delays in the acceptance of scientific knowledge. Despite the huge loss of human lives smoking significantly affects the expenditure envisaged for health.5,6

In relation to the timing of the stent thrombosis it is divided into:
- Acute – 24 hours after stent implantation,
- Subacute – 24 hours to 30 days after stent implantation,
- Late – 30 days to 1 year after stent implantation,
- Very late – more than one year after stent implantation.

The definition of stent thrombosis was proposed by the Academic Research Consortium (ARC). Some authors believe that the use of precisely ARC definitions of stent thrombosis provides the best estimate of the true prevalence of this phenomenon.

According to this classification stent thrombosis are divided into:
- Definitive – angiographic evidence of stent thrombosis with clinical signs of myocardial ischemia within 48 hours (chest pain with ECG changes or an increase of cardiac enzymes). Pathological evidence of stent thrombosis,
- Probable – unexplained death within 30 days after stent implantation. Myocardial infarction region stentirane artery
- Possible – the unexplained death after more than 30 days after stent implantation.7

Aim

Based on all the above aim of this study was to determine the influence of risk factors (smoking) the number and severity of adverse cardiac events and their possible selective effect on the occurrence of acute and
subacute thrombotic complications during the application of stents coated with paclitaxel (PES) and sirolimus-coated stents (SES).

Hypothesis

Based on the literature data is not expected difference in the security application of stents coated with paclitaxel and sirolimus-coated stents with regard to the occurrence of acute and remote thrombotic complications.

Materials and Methods

Five-year follow-up of all consecutive patients at the Institute for Cardiovascular Diseases Dedijne, in which the embedded drug eluting stents with sirolimusom (Cypher) and paclitaxel (Taxus).

Monitoring methods: ambulatory visits, and telephone contact with the patient. The study was retrospective, clinical, nonintervention, with the follow-up period of five years for an individual patient. Data on the patients included in the database formed to monitor. Enter their demographic, clinical, angiographic data.

Telephone interview with patients was based on a questionnaire containing the contact details of the patient, date of the telephone contact, presence of diabetes mellitus, evaluation angina eventual death of the patient, information on the occurrence of death, hospitalization for cardiac reasons, myocardial infarction, percutaneous coronary revascularization or surgical myocardial revascularization. The questionnaire contains questions related to all the drugs taken by the patient after the intervention, especially acetyl-salicylic acid, ticlopidine or clopidogrel, thienopyridine derivatives duration of therapy, statin therapy, the presence of risk factors (hiperlipoproteinemia, smoking). Based on the questionnaire, if judged to have significant angina patients, the patients were invited to a preview on an outpatient basis of which were sent to the existence of non-invasive testing provoked ischemia, and in case of ischemia, were sent to coronary angiography and subsequent percutaneous myocardial revascularization or surgery or resume conservatively therapy.

Significant adverse cardiac events, MACE are defined as follows. Death is defined as cardiac or noncardiac origin. The death of unknown cause was recorded as cardiac origin. On the basis of ischemic changes in the ECG and / or an increase in CK three times the upper limit of the laboratory reference value, an increase in troponin T above the upper limit of reference values were used for the definition of myocardial infarction.

All reintervention within the stent implanted during the index procedure, as well as 5 mm proximal or distal edges of the stent implanted classified as re-target lesion revascularization, TLR (target lesion revascularization). Other percutaneous coronary intervention on the same blood vessel outside the defined zones are defined as repeat revascularization of the target vessel, TVR (target vessel revacularization).

Accompanied by the outcome of patients in the study group was also stent thrombosis according to ARC criteria.

Initially the study included 800 patients who underwent percutaneous coronary angioplasty. After the indexing procedure clinical monitoring is completed for 701 (87.6%) patients whose data after the completion of the follow-up period subjected to statistical analysis. Ninety-nine patients (12.3%) were not available for cooperation. Of the 701 patients in whom were implanted stents, 340 patients were implanted stents coated with sirolimus and in 361 patients with paclitaxel-coated.

Statistical Analysis

In case of continuous data, variables were presented as mean value ± standard deviation (SD).

Some of the variables were presented as frequency of certain categories, while statistical significance of differences was tested with the Chi square test. In the case of low frequencies, probability is calculated by Fisher's Exact test.

The Kaplan-Meier non-parametric statistic was used to estimate the survival function of clinical outcome
DRUG-ELUTING STENTS – THROMBOTIC COMPLICATIONS

(MACE events) in nonsmokers and smokers. Post hoc analysis was done by using log rank test.

Differences between groups were considered significant at p<0.05. Complete statistical analysis of the data was conducted with the statistical software package, SPSS Statistics 18 (Chicago, Illinois, USA).

Results

Average age of the tested population was 68.4 +/- 8.4 years, of which 585 patients were men (83.4%).

Four patients (0.6%) died. Two patients death is of noncardiac origin, so that the two patients had fatal consequence of cardiac events. The occurrence of angina prompting the 288 patients (36.8%). Load test was positive in 215 patients (30.7%). Myocardial infarction occurred in nine patients (1.3%). Re-PCI was performed in 103 patients (14.7%). Surgical revascularization was performed in 42 patients (5.8%). The overall incidence of MACE events was 14.5%, or 102 pancijenat. Repeated coronary angiography was performed in 230 patients (32.8%).

Stent thrombosis, definite criteria according to ARC, occurred in 22 patients (3.14%), 5 patients (0.7%) were treated with CABG, and in 17 patients (2.4%) is done re-pci. Probable stent thrombosis in 1 patient (0.14%), possible stent thrombosis in 1 patient (0.14%).

Of the 24 patients in whom stent thrombosis occurred 10 (1.4%) had a stent coated with sirolimus, 14 (2%) had a stent coated with paclitaxel.

Of the 22 patients who came forward certain stent thrombosis, 12 (1.7%) patients had a stent coated with paclitaxel, 10 (1.4%) patients had a stent coated with sirolimus. Probable stent thrombosis occurred in 1 (0.14%) patients with paclitaxel, possible stent thrombosis occurred in 1 (0.14%) patients with paclitaxel.

Distribution of patients according to the type of stent implanted (Table 1).

After implantation of the two types of stents when it comes to survival, there was no statistically significant difference, despite the fact that all patients with lethal results belonged to the group of PES (Table 2).

When it comes to myocardial infarction showed statistically significantly greater number of myocardial infarction in the PES group (p=0.004) (Table 3).

When it comes to TLR all registered cases (N=31), took place on implanted PES (p<0.001) compared to the group SES (Table 4).

When it comes to TVR more than ¼ of registered cases (N=56) occurred in patients belonging to the group SES (p<0.001), statistically highly significant difference (Table 5).

Speaking of MACE no significant difference between the two types of stents (Table 6).

Distribution of patients (habit of smoking) in relation to the type of implanted stent is uniform between groups SES and PES (Table 7).

Table 1. Distribution of patients using 2 different drug eluting stents

<table>
<thead>
<tr>
<th>Percutaneous coronary intervention</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>340</td>
<td>48.5</td>
</tr>
<tr>
<td>PES</td>
<td>361</td>
<td>51.5</td>
</tr>
<tr>
<td>Total</td>
<td>701</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Statistics Chi-Square = 3.78; p=0.07
A statistically significantly higher number of smokers completed annually in the PES group (p=0.048) (Table 8).

Statistically significantly higher MI in the PES group of smokers (Table 9).

Statistically significantly higher number of MACE in the PES group of smokers (Table 10).

Based on statistical processing (Table 10) and Kaplan-Mayer curve (Figure 1), it is concluded that in non-smokers, 50% of MACE occurs after 61,714 months, and smokers are slightly earlier (60,180 months). Using a log-rank test showed a statistically significant difference between these two groups (p=0.013) (Table 11).

**Discussion**

Stent thrombosis (TS) is a rare but potentially fatal complication of percutaneous coronary intervention (PCI). The frequency of TS varies in literature depending on the type of stent, it presents patients with stable angina...
pectoris and acute coronary syndrome in the study, etc. The obtained data on the incidence of stent thrombosis are consistent with the data obtained in many world studies.

The success of drug-coated stents is highly dependent on each component of the complex as well as the interactions among the elements of the complex. Different DES have different potential to inhibit neointimal proliferation.\textsuperscript{8,9} Given the fact that the experiments on animal models can not be directly translated to human populations, using the results of clinical studies.

In cardiology, as in any other branch of medicine revived the concept of 'evidence-based medicine'. On a number of important questions attempted to come up with an answer through a well-designed, controlled, prospective, randomized trials.\textsuperscript{10,11}

The first positive clinical data on the implementation of DES come from a study that examined the use of rapamycin (Sirolimus trade name).

**Table 7. Distribution of smokers regarding stent types implantation**

<table>
<thead>
<tr>
<th>Smokers</th>
<th>SES</th>
<th>PES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No (outcome)</td>
<td>210</td>
<td>245</td>
<td>455</td>
</tr>
<tr>
<td>(stents)</td>
<td>46.2%</td>
<td>53.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Yes (outcome)</td>
<td>130</td>
<td>116</td>
<td>246</td>
</tr>
<tr>
<td>(stents)</td>
<td>52.8%</td>
<td>47.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total (outcome)</td>
<td>340</td>
<td>361</td>
<td>701</td>
</tr>
<tr>
<td>(stents)</td>
<td>48.5%</td>
<td>51.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Statistics</td>
<td>Fisher’s Exact Test = 2.60; p=0.107</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miocardial infarction</th>
<th>SES</th>
<th>PES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No (outcome)</td>
<td>130</td>
<td>107</td>
<td>237</td>
</tr>
<tr>
<td>(stents)</td>
<td>54.9%</td>
<td>45.1%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Yes (outcome)</td>
<td>0</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>(stents)</td>
<td>0.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total (outcome)</td>
<td>130</td>
<td>116</td>
<td>246</td>
</tr>
<tr>
<td>(stents)</td>
<td>52.8%</td>
<td>47.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Statistics</td>
<td>Fisher’s Exact Test = 8.38; p=0.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 8. Lethal outcome in smoking patients regarding stent types implantation**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>SES</th>
<th>PES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survivors (outcome)</td>
<td>113</td>
<td>86</td>
<td>199</td>
</tr>
<tr>
<td>(stents)</td>
<td>56.8%</td>
<td>43.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Died (outcome)</td>
<td>17</td>
<td>30</td>
<td>47</td>
</tr>
<tr>
<td>(stents)</td>
<td>36.2%</td>
<td>63.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total (outcome)</td>
<td>130</td>
<td>116</td>
<td>246</td>
</tr>
<tr>
<td>(stents)</td>
<td>52.8%</td>
<td>47.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Statistics</td>
<td>Fisher’s Exact Test = 2.65; p=0.048</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 9. Myocardial infarction in smoking patients regarding stent types implantation**

<table>
<thead>
<tr>
<th>MACE</th>
<th>SES</th>
<th>PES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No (outcome)</td>
<td>113</td>
<td>86</td>
<td>199</td>
</tr>
<tr>
<td>(stents)</td>
<td>56.8%</td>
<td>43.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Yes (outcome)</td>
<td>17</td>
<td>30</td>
<td>47</td>
</tr>
<tr>
<td>(stents)</td>
<td>36.2%</td>
<td>63.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total (outcome)</td>
<td>130</td>
<td>116</td>
<td>246</td>
</tr>
<tr>
<td>(stents)</td>
<td>52.8%</td>
<td>47.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Statistics</td>
<td>Chi-Square = 5.68; p=0.017</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
coated stents (SES). Rapamycin is a natural macrocyclic lactone with potent antiproliferative, anti-inflammatory and immunosuppressive action of the inhibitory effect on the activation of the target sites for rapamycin - mammalian target of rapamycin (mTOR), ultimately leading to cell cycle arrest.\textsuperscript{12,13}

Cypher (Cordis, Johnson & Johnson) is a stainless steel stent covered with a very thin layer of polymer containing neerodirajueeg rapamycin. The first implantation of Cypher stent is made in the First in Man (FIM) clinical study in Sao Paulo, Brazil and Rotterdam, the Netherlands. Four months after implantation, by using intravascular ultrasound and quantitative coronary angiography, in both studies was demonstrated minimal neointimal hyperplasia. In the Brazilian study of intravascular ultrasound after 4 years of follow-up showed continued suppression of intimal hyperplasia in a group of 30 patients with slow-releasing SES, with survival without significant clinical events by 87%.\textsuperscript{14}

This test has demonstrated a low incidence of stent thrombosis (definite, probable, possible) and thereby simultaneously demonstrated safe use of stents coated with the drug.

The results of our study were compared with published results of the studies and meta-analyzes that examined the long-term safety and efficacy of drug-coated stents, either through long-term monitoring of patients revascularized only the implantation of DES, or in comparison to patients who were implanted with a metal stent is not coated with a drug.\textsuperscript{15,16} We analyzed primarily studies published in reputable journals and reference cardiology.

Demographic, clinical and angiographic characteristics of the study group in our study are in accordance with the same characteristics examined groups in the studies in which they are declared.

The research showed that the use of drug-eluting stents to treat coronary disease showed a low incidence of major cardiac events (death, MI, TLR, TVR) during the follow-up of five years. Application of DES leads to lower rates of repeat revascularization (percutaneous coronary intervention or bypass surgery).

Analyses have shown the safety of the use of drug-coated stents, and in particular to the emergence of thrombosis which is not higher in DES compared to the BMS.\textsuperscript{17,18} The occurrence of thrombosis in BMS was studied in many international studies and the data obtained are in favor of the data from our study where they analyzed patients with drug-coated stents, to the emergence of thrombosis in DES is not greater than the occurrence of thrombosis in BMS. Meta-analyzes may increase the strength of the evidence of individual studies, but also to distinguish quality (indicate) the effects of certain methods of treatment. A meta-analysis

<table>
<thead>
<tr>
<th>Smokers</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>No</td>
<td>61.714</td>
<td>0.454</td>
<td>60.824</td>
</tr>
<tr>
<td>Yes</td>
<td>60.191</td>
<td>0.763</td>
<td>58.696</td>
</tr>
<tr>
<td>Total</td>
<td>61.180</td>
<td>0.399</td>
<td>60.397</td>
</tr>
</tbody>
</table>

*Median could not be obtained due to distribution of MACE data

**Table 11. Cumulative probability of MACE events in nonsmokers and smokers (Kaplan-Maier method; N=701)**

![Figure 1. Cumulative probability of MACE events in nonsmokers and smokers (five-year follow-up).](image-url)
of randomized studies on the implementation of medication-coated stents compared to uncoated (Fushs AT et al., 2008) included 28 randomized studies that have been analyzed stent thrombosis patients undergoing DES, BMS and balloon angioplasty. The total number of patients from the DES group was from 5612 a BMS Group 7639th Stent thrombosis occurred in 107 patients (1.05%), of which 56 patients were from the DES groups (1.01%) and 51 patients were from BMS groups (1.10%). The results showed no significant differences between the two groups (OR = 0.87, 95% CI 0.58 to 1.3, p<0.48). Subacute thrombosis occurred in a total of 21 patients, of which 0.43% of the DES group and 0.53% in BMS groups (OR = 0.86, 95% CI 0.50 to 1.5, p<0.6) . Late stent thrombosis occurred in 27 patients (1%) in the DES group and 20 patients (0.8%) in the BMS groups (OR = 0.92, 95% CI 0.50 to 1.68, p<0.78). After 12 months of intervention results showed a similar incidence of subacute thrombosis and late thrombosis in all types of PCI.19

The study, Goy, and associates from 2009 analyzed 350 patients with a SES embedded between April and December 2002 in three Swiss hospitals. Patients were 63 +/- 6 years, 78% were men, 20% had acute coronary syndrome, 19% were patients with diabetes. Stent thrombosis occurred in 12 patients (3.6%). Definitive stent thrombosis occurred in 6 (1.8%), probable 1 (0.3%), possible 5 (1.5%). Eighty-one patients were without complications. MACE events occurred in 74 patients (21%): cardiac death 10 (3%), unborn death 16 (5%), myocardial infarction 6 (2%), TLR 26 (8%), TVR 9 (3%), by-pass graft 6 (2%).20

In our research, after implantation of the two types of stents, when it comes to survival, there was no statistically significant difference, despite the fact that all patients with lethal results belonged to the group of PES. Join a statistically significantly greater number of myocardial infarction in the PES group (p=0.004). When it comes to TLR all registered cases (N=31), took place on implanted PES (p<0.001). In more than ¾ of registered cases (N=56) TVR occurred in patients belonging to SES group (p<0.001). There is no significant difference between the two types of stents in terms of MACE.

Smoking is the most important modifiable risk factor for coronary disease and the leading cause of death in developed countries. Today in the world smokes about one billion people. The risk of myocardial infarction is high even among smokers if they are exposed to passive smoking. Among those who smoke 20 or more cigarettes daily have a triple increase in total coronary heart disease. Our research showed significant statistical association of smoking as a risk factor and the occurrence of fatal outcome, despite the fact that the number of deaths was not alarming. Smoking as a risk factor significantly contributes to the occurrence of myocardial infarction (highly statistically significantly contributes to the occurrence of myocardial infarction). Smoking also significantly affects the occurrence of MACE.

Prospective multicentre German Drug-Eluting Stent Registry (DES.DE) analyzed and identified 1,122 patients who had never smoked and 1,052 patients who were current smokers. Smokers were younger (56.5 vs. 69.4 years, p<0.0001), more often males, with less frequent diabetes and hypertension compared to non-smokers. Smokers presented more often with acute coronary syndromes. After a mean follow-up of 12.5 months, smokers had both higher mortality (4.6 vs. 2.7%, p<0.05) and myocardial infarction (MI) rates (4.9 vs. 3%, p<0.01). There was no significant difference between smokers and non-smokers in the rate of target vessel revascularization (9.8 vs. 11.4%, p=0.26). Major adverse cardiac and cerebrovascular events (defined as the composite of death, MI and stroke, MACE) were higher in smokers (10.6 vs. 6.1%, p<0.001). Moreover, after adjustment for baseline clinical and angiographic variables, smoking continued to be a strong independent predictor for MACE (OR = 2.34, 95% CI 1.49-3.68). In a subgroup analysis, we found that the increased risk of smoking was most prominent in patients presenting with stable angina pectoris (OR = 3.71, 95% CI 1.24-2.57, p<0.05). Smoking almost doubled the risk for MACE in acute MI patients, though this did not reach statistical significance (adjusted OR = 1.91, 95% CI 0.93-3.94, p=0.74).

This large multicentre DES registry provides evidence that smokers treated with DES, despite lower incidence of predisposing risk factors for
atherosclerosis, experience higher rates of death and MI compared to non-smokers, particularly in the setting of stable coronary artery disease. Smoking has only marginal effects on target vessel revascularization rates in patients treated with DES.21

Conclusion

Sirolimus and paclitaxel-coated stents are safe and effective means of percutaneous coronary interventions used for treatment of atherosclerotic coronary artery disease.

Our results agree with the results of randomized clinical trials and large registries which examined sirolimus and paclitaxel-coated stents.

Our research showed that the use of drug-eluting stents to treat coronary disease has a low incidence of major cardiac events (death, MI, TLR, TVR) during the period of five years examined groups of patients. Application of DES leads to lower rates of repeat revascularization (percutaneous coronary intervention or bypass surgery).

The significance of our study is the presentation of results from clinical practice follow-up of patients due to the current problem of stent thrombosis with the drug-coated stents. The results of low incidence of stent thrombosis are in favor of safe use of stents coated drug.

Research has shown a large impact of smoking as a risk factor in the development of adverse cardiac events. There is a significant correlation between smoking as a risk factor and the occurrence of a lethal outcome, and if the number of deaths was not alarming. Smoking as a risk factor also significantly contributes to the occurrence of myocardial infarction (highly statistically significantly contributes to the occurrence of myocardial infarction).

References


