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KORONER YURAK KASALLIGINI DAVOLASHDA BIORESORBLANADIGAN QON TOMIR STENTLARI VA DORI VOSITALARINI YUTUVCHI STENTLAR: META-TAHLIL

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Annotatsiya

Ushbu tadqiqotning maqsadi — yurak ishemik kasalligida bioresorblanuvchi tomir stentlari (BVS) va dori bilan qoplangan stentlar (DES) ning klinik samaradorligi va xavfsizligini taqqoslab baholashdan iborat. Meta-tahlil PubMed, EMBASE, Springer va Wiley-Blackwell kabi xalqaro ma'lumotlar bazalaridan olingan randomizatsiyalangan nazoratli tadqiqotlar asosida o'tkazildi. Tahlilga jami 6 383 nafar bemorni o'z ichiga olgan 10 ta tadqiqot kiritildi.Natijalar shuni ko'rsatdiki, BVS bilan davolangan bemorlarda maqsadli lezyon yetishmovchiligi, stent trombozi va yurak o'limi ko'rsatkichlari DES bilan davolangan bemorlarga nisbatan sezilarli darajada yuqori bo'lgan. Aksincha, DES klinik natijalarning barqarorroq bo'lishini ta'minlab, koronar qon oqimini tiklashda yuqori samaradorlikni ko'rsatdi. Bundan tashqari, DES qayta revaskulyarizatsiya amaliyotlari sonining kamligi va uzoq muddatli tomir o'tkazuvchanligining yaxshilanishi bilan bog'liq bo'ldi.

Xulosa qilib aytganda, hozirgi vaqtda DES yurak ishemik kasalligini davolashda xavfsizroq va ishonchliroq strategiya hisoblanadi. Biroq, BVS texnologiyasi rivojlanishda davom etmoqda va kelajakda uning klinik qo'llanilishi hamda xavfsizlik ko'rsatkichlari yanada yaxshilanishi mumkin.

Kalit So'Zlar

bioresorblanuvchi stent, dori bilan qoplangan stent, yurak ishemik kasalligi, tromboz, revaskulyarizatsiya, meta-tahlil, perkutan koronar intervensiya, restenoz.

BIORESORBABLE VASCULAR SCAFFOLDS AND DRUG-ELUTING STENTS IN THE TREATMENT OF CORONARY HEART DISEASE: A META-ANALYSIS

Abstract

The aim of this study is to comparatively evaluate the clinical efficacy and safety of bioresorbable vascular scaffolds (BVS) and drug-eluting stents (DES) in coronary heart disease. A meta-analysis was conducted based on randomized controlled trials obtained from international databases such as PubMed, EMBASE, Springer, and Wiley-Blackwell. A total of 10 studies involving 6,383 patients were included in the analysis.

The results demonstrated that patients treated with BVS had significantly higher rates of target lesion failure, stent thrombosis, and cardiac mortality compared to those treated with DES. In contrast, DES showed more stable clinical outcomes and higher effectiveness in restoring coronary blood flow. Additionally, DES were associated with a lower incidence of repeat revascularization procedures and improved long-term vessel patency. In conclusion, DES currently represents a safer and more reliable treatment strategy for coronary artery disease.

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However, BVS technology continues to evolve, and future improvements may enhance their clinical applicability and safety profile.

Keywords

bioresorbable stent, drug-eluting stent, coronary heart disease, thrombosis, revascularization, meta-analysis, percutaneous coronary intervention, restenosis

INTRODUCTION

Coronary heart disease is currently one of the leading causes of mortality and disability worldwide. This condition mainly develops as a result of lipid metabolism disorders, leading to the accumulation of atherosclerotic plaques in the intimal layer of arteries. As a result, the blood vessels narrow, impairing blood supply to the myocardium and potentially leading to ischemia, angina pectoris, or myocardial infarction.

In modern medicine, one of the most effective treatment methods for this condition is percutaneous coronary intervention (PCI) with stent implantation. This minimally invasive procedure has significantly improved patient outcomes and reduced mortality rates associated with coronary artery disease.

In recent years, drug-eluting stents (DES) have been widely used in clinical practice due to their ability to release antiproliferative drugs that inhibit neointimal hyperplasia. At the same time, bioresorbable vascular scaffolds (BVS) have been introduced as a novel technology, attracting significant interest because of their potential to provide temporary support and then gradually dissolve, restoring natural vascular physiology.

This article focuses on evaluating the efficacy and safety of BVS compared to DES and analyzes their clinical outcomes. The findings of this study are particularly relevant for cardiologists, interventional specialists, and medical students, as they provide insight into the optimal choice of stent technology in current clinical practice.

MAIN PART

Stents play a crucial role in the treatment of coronary heart disease by maintaining vessel patency and improving myocardial perfusion. Drug-eluting stents are coated with a special polymer that releases antiproliferative drugs, preventing restenosis of the vessel wall. Therefore, DES are considered more effective than bare-metal stents and have become the standard of care in many clinical settings.

Bioresorbable stents, on the other hand, have the ability to gradually dissolve within the body over time. Their main advantage lies in providing temporary mechanical support and subsequently allowing the restoration of natural vascular function, including vasomotion and endothelial healing. However, their safety has not been fully established in clinical practice, and concerns remain regarding their mechanical strength and long-term outcomes.

According to the conducted meta-analysis, patients treated with BVS showed an increased rate of target lesion failure (OR=1.46). Moreover, the risk of stent thrombosis (OR=2.70) and cardiac mortality (OR=2.19) was significantly higher compared to DES. These findings indicate that, despite their theoretical advantages, BVS may currently present higher clinical risks.

These findings may be associated with the current design and implantation techniques of BVS. In particular, inadequate lesion preparation, improper sizing, and insufficient post-dilation may contribute to a higher risk of thrombosis. Additionally, thicker strut design and slower

endothelialization may also play a role in adverse outcomes. Current clinical guidelines do not strongly recommend the widespread use of BVS, limiting their application to selected cases.

Meanwhile, new-generation bioresorbable stents, such as magnesium-based scaffolds, are under development. These devices are expected to have lower thrombogenicity, faster resorption rates, improved radial strength, and better biocompatibility, which may overcome the limitations of first-generation BVS.

CONCLUSION

Based on the findings of this study, bioresorbable stents demonstrated lower safety compared to drug-eluting stents. In particular, the increased risk of stent thrombosis and cardiac mortality represents a significant clinical concern. Therefore, DES are currently considered the most reliable and effective treatment option for coronary heart disease.

Furthermore, DES have consistently shown favorable long-term clinical outcomes, including reduced rates of restenosis, lower need for repeat revascularization, and improved overall patient prognosis. Their well-established safety profile and continuous technological improvements make them the preferred choice in routine clinical practice.

Despite these findings, bioresorbable stents remain a promising technology with the potential to transform interventional cardiology in the future. Their ability to provide temporary vascular support and subsequently restore natural vessel function represents an important physiological advantage.

However, current limitations such as increased thrombogenicity, suboptimal mechanical properties, and procedural challenges must be addressed. Future advancements in stent design, biomaterials, and implantation techniques may significantly enhance the safety and effectiveness of BVS.

Continued innovation, along with large-scale, long-term randomized clinical trials, is essential to better define the role of bioresorbable stents and to determine whether they can become a viable alternative to DES in selected patient populations.

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