

Summary and conclusions

Conclusions

- ▶ Compared with bare metal mesh stents, drug-eluting stents prevent the recurrence of narrowing of the coronary artery, without increasing the risk of complications. This applies to both stable and unstable coronary artery disease.
- ▶ Various drug-eluting stents may differ in both effect and risks:
 - Everolimus-eluting stents give rise to fewer stent thromboses than sirolimus-eluting stents, and fewer myocardial infarctions and stent thromboses than paclitaxel-eluting stents.
 - However, in comparative studies, there seem to be no differences in safety or effect of everolimus-, biolimus- or second-generation zotarolimus-eluting stents.

Drug-eluting stents

In ischemic heart disease, atherosclerosis causes narrowing of the coronary arteries. Percutaneous coronary intervention is a general term for a number of procedures to treat this type of narrowing. The patient is awake, and after local anaesthesia a catheter is inserted via an artery in the arm or the groin. In the 1980s and early 1990s, the most common intervention was simply to widen the narrowing with a balloon catheter. Two disadvantages of this method are the risk of acute post-operative closure of the artery and the risk of recurrence of the arterial narrowing at the previously treated site, i.e. restenosis, which occurs in approximately 30 percent of cases. The introduction of stents during the 1990s reduced the risk of restenosis by approximately half. The metal mesh stents are inserted into the coronary artery at the site of the narrowing and expanded by a balloon

(Figure 1). While bare metal stents attenuate arterial recoil after balloon angioplasty, they can lead to increased new formation of smooth muscle cells inside the stent in the first months after the procedure. In order to overcome this and to try to reduce the risk of restenosis further, stents which secrete growth-inhibiting drugs were developed.

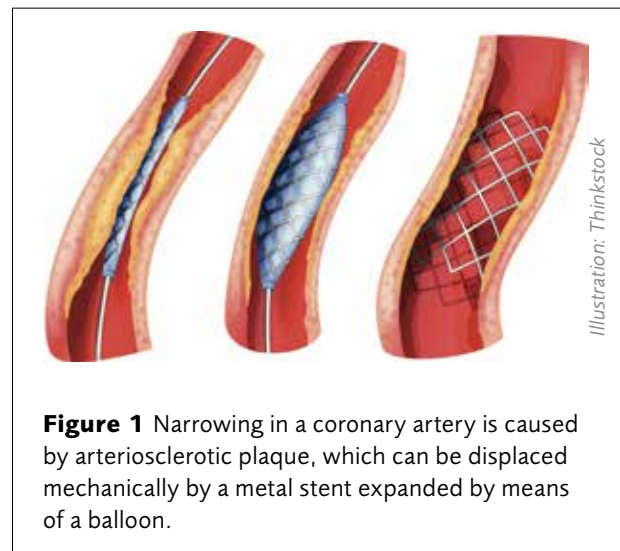


Figure 1 Narrowing in a coronary artery is caused by arteriosclerotic plaque, which can be displaced mechanically by a metal stent expanded by means of a balloon.

Questions

- In treatment of narrowing of the coronary arteries, what are the effects of drug-eluting stents compared with bare metal mesh stents on the risk of death, myocardial infarction, restenosis, stent thrombosis and quality of life?
- Are there any differences in effectiveness and safety among different types of drug-eluting stents?
- What are the side effects and risks of treatment with drug-eluting stents?
- What does the treatment cost? Is it cost-effective?

Results

Appendices available at www.sbu.se/201406:

- Evidence-graded result: See Appendix 1a.
- Meta-analyses of odds ratio and hazard ratio: See Appendix 1b.
- Calculation of difference in risk: See Appendix 1c.

Summary of meta-analyses

The table shows the results of the meta-analyses included in this report. For certain comparisons, no studies of sufficiently high quality could be identified. The following complications associated with the various drug-eluting stents are compared: death, myocardial infarction, restenosis and stent thrombosis.

Economical aspects

The expected cost of the treatment, corrected for additional procedures to treat restenosis, is calculated at around SEK 65 000. The cost per stent has decreased significantly over the last few years. The difference in cost per patient treated with drug-eluting stents and bare metal stents has also decreased. Depending on the frequency of restenosis, the expected total cost of treatment, based on Cochrane data*, is estimated to be around SEK 2000 less for drug-eluting than for bare metal stents. According to data from the Swedish Coronary Angiography and Angioplasty Registry (SCAAR)*, the corresponding estimate is SEK 2000 higher for drug-eluting than for bare metal stents.

The choice of stent can thus be regarded as a medical rather than a financial decision.

References

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- ** Svenska Coronar Angiografi- och Angioplastik Registret (SCAAR). Annual reports. [Web site]. Uppsala Clinical Research Center (UCR). [visited 2014-02-11]. Available at: <http://www.ucr.uu.se/scaar/index.php/arsrapporter>

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Table A Results of meta analyses.

	Sirolimus-eluting stent (SES)	Paclitaxel-eluting stent (PES)	Zotarolimus-eluting stent (1st generation) (ZES 1)	Zotarolimus-eluting stent (2nd generation) (ZES 2)	Everolimus-eluting stent (EES)	Biolimus-eluting stent (BES)
SES		Restenosis SES lower risk than PES	Restenosis SES lower risk than ZES 1	No studies	Stent Thrombosis EES lower risk than SES	No significant difference
PES			Restenosis ZES 1 lower risk than PES	No studies	Myocardial Infarction EES lower risk than PES Restenosis EES lower risk than PES Stent Thrombosis EES lower risk than PES	No studies
ZES 1				No studies	No studies	No studies
ZES 2					No significant difference	No studies
EES						No significant difference
BES						