

Economic evaluation of IVUS (intravascular imaging) for patients with coronary artery disease in Bulgaria



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OBJECTIVES: Intravascular ultrasound (IVUS) is an imaging modality used primarily in interventional cardiology to characterize lesion morphology, quantify plaque significance, guide stent sizing, assess stent implantation, and identify procedural complications. The primary objective of this study was to perform an economic assessment of IVUS for imaging in patients with coronary artery disease in Bulgaria.

METHODS: The economic method chosen for the evaluation of IVUS is a cost-utility analysis. In addition, a cost-effectiveness analysis was also conducted. Health benefits for patients in the applied model are measured as quality-adjusted life years (QALYs) and life-years added (LYs). A model evaluating the cost-effectiveness of IVUS-guided percutaneous coronary intervention (PCI) versus PCI with the classic angiography-guided strategy was build. The duration of the time horizon is up to a lifetime. Costs and health benefits are discounted with 3,5%. The cost estimate reflects the payer's perspective (NHIF). A probabilistic and one-way sensitivity analysis was performed.

RESULTS: The results show that IVUS is cost-effective in STEMI patients compared to angiography guided PCI (ICUR = BGN 8,757.12/QALY and ICER = BGN 4,722.67/LYs), with a favourable cost-effectiveness threshold of BGN 60,636.00. Calculated ICUR and ICER values for IVUS in UA/NSTEMI patients (ICUR = 16,238.27 BGN/QALY and ICER = 9,006.28 BGN. /LYs) relative to alternative medical activity (CA-led PCI) are located in the second quadrant of the cost-effectiveness graph (south-east - lower cost at higher health benefit values) below the conventionally accepted threshold for favourable cost-effectiveness of BGN 60,636.00/QALY.

	IVUS	Coronary angiography
Total costs, BGN	13 372,39	11 043,00
QALYs	6,0040	5,7380
Incremental relations, costs, BGN	2 329,40	
Incremental <u>realtions</u> , QALYs	0,2660	
ICUR (BGN/QALYs)	8 757,12	
LYs	10,9381	10,4448
LYs gained	0,4932	
ICER (BGN/LYs)	4 722,67	

Fig. 1 Results of the cost-effectiveness analysis

CONCLUSION: Routine use of IVUS has been shown to result in fewer serious cardiovascular events within the first year, a significant reduction in the cost of drug-eluting stent placement, a significant reduction in costs due to avoidance of stent edge apposition and dissection, in-stent restenosis (ISR), stent thrombosis, etc.