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## How to improve long-term prevention in young patients after myocardial infarction - the IPP-Y study

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**Background:** Patients who experienced myocardial infarction (MI) at a young age are of special medical and socioeconomic interest; cardiovascular risk factor control to prevent recurrent events is crucial in this specific cohort.

**Objectives:** The purpose of the study was to evaluate long-term risk factor control in young MI-patients in clinical practice and investigate the effects of a modern intensive prevention program in a prospective randomized trial. In a genetic substudy it was analyzed if prevention effects were depending on individual genetic risk.

**Methods:** Patients who had MI at age of  $\leq 45$  years were revisited after a mean period of  $5.7 \pm 4.0$  years to evaluate long-term risk factor control. Furthermore a 12-months intensive prevention program in young MI-patients (IPP-Y), coordinated by non-physician prevention assistants and including personal teachings, telephone contacts, clinical and telemetric control of risk factors, was compared to usual care in a randomized trial. Primary endpoint of the randomized trial was prevention success, defined as improvement of one of the risk factors smoking, LDL cholesterol or physical inactivity without deterioration of the others. As the opposite prevention failure was defined as deterioration of one of the risk factors without improvement of the others. Genetic risk was assessed by polygenic risk scores, based on 163 SNPs.

**Results:** Only a minority of the 277 young patients after MI achieved guideline-recommended risk factor targets at long-term follow-up visits: mean body mass index was  $29.9 \pm 5.1$  kg/m<sup>2</sup>, just 14.8% had a body mass index  $< 25$  kg/m<sup>2</sup>. More than one third (38.3%) were persistent or recurrent smokers. Mean LDL cholesterol level was  $94 \pm 38$  mg/dl, only 27.1% of the patients achieved LDL cholesterol levels  $< 70$  mg/dl.

However, the long-term prevention program IPP-Y led to a higher rate of the primary endpoint prevention success (IPP-Y: 49% vs. UC: 27%,  $p < 0.05$ ) and a lower rate of prevention failure (IPP-Y: 15% vs. UC: 38%,  $p < 0.05$ ) compared to usual care after 12 months (see figure). Telemetric control of risk factors as part of the prevention program was used by 71.4% of the patients.

In the genetic subanalysis prevention effects were found in both, patients with high genetic risk as well as patients with low genetic risk assessed by polygenic risk scores ( $p = 0.79$  high vs. low genetic risk).

**Conclusions:** To our knowledge this is the first study on young patients with MI that demonstrates insufficient long-term risk factor control in clinical practice and significant effects of an intensive prevention program. Prevention effects were independent from individual genetic risk.

