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## High attainment rate of low-density lipoprotein cholesterol among high-risk patients treated with lipid-lowering agents — experience from the Cardiac Clinic, Queen Mary Hospital

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**Aim:** It has been shown that maintenance of satisfactory low-density lipoprotein cholesterol (LDLC) level effectively reduced morbidity and mortality associated with cardiovascular disease. Nevertheless, previous studies have demonstrated a uniformly low LDLC goal attainment rate across different geographic areas. This study sought to evaluate the LDLC goal attainment rate among high-risk patients treated in our centre and to identify the determinants of effective LDLC management.

**Methods:** A cross-sectional study was conducted in the cardiology clinics of Queen Mary Hospital between April and December 2008. Patients aged ≥18 years with ≥2 cardiovascular risk factors, who had been treated with lipid-lowering agents for at least 3 months and no dose adjustment in recent 6 weeks were recruited. Demographic data and other relevant clinical information were collected, and full lipid profiles were measured and compared with therapeutic targets. All definitions and criteria set by the updated 2004 Adult Treatment Panel III guidelines of the National Cholesterol Educational Program (NCEP ATP III) on cholesterol management were applied.

**Results:** A total of 561 patients (mean age 65.2±10.6 years, 76.9% male) were identified; 534 of them (95.2%) had coronary artery disease (CAD). In all, 465 (82.9%) patients achieved their LDLC goals, including 83.1% of those with target LDLC <70 mg/dL, 100% of those with target LDLC <100 mg/dL, and 53.8% of those whose LDLC target <130 mg/dL. Univariate logistic regression analyses revealed that patient's baseline LDLC (OR=0.98; 95% CI, 0.97-0.99; P<0.001 for each 100 mg/dL), gender (female: OR=0.62; 95% CI, 0.39-0.99; P=0.043), systolic (OR=0.98; 95% CI, 0.97-0.99; P=0.002) and diastolic blood pressure (OR=0.97; 95% CI, 0.95-0.99; P=0.002), physician's gender (female: OR=0.31; 95% CI, 0.14-0.70; P=0.009) and years of practice (OR=1.37; 95%CI, 1.01-1.87; P=0.046), prescription of lipid-lowering drugs only to patients who adhered to life-style modification (OR=5.64; 95% CI, 3.00-10.63; P<0.001), patients informed of their high-density lipoprotein cholesterol (OR=1.90; 95% CI, 1.10-3.28; P=0.026) and triglyceride levels (OR=1.91; 95% CI, 1.08-3.39; P=0.03) were significant predictors of LDLC goal attainment.

**Conclusion:** High-risk patients treated with lipid-lowering agents in our centre were able to achieve a very high LDLC attainment rate with majority of patient achieved LDLC <70 mm Hg. Both patients' understandings of their lipid profile and physicians' practice were shown to have a major impact on treatment outcomes, reflecting the importance of patient's and doctor's education and their communication in implementing effective lipid-lowering therapy.

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## Role of heme oxygenase-1 in intermittent hypoxia-induced inflammation and oxidative stress in EAhy 926 endothelial cell line

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**Introduction:** Intermittent hypoxia (IH) is a hallmark feature in obstructive sleep apnoea (OSA), which is increasingly recognised as an independent risk factor for atherosclerosis. Although the underlying mechanisms have not been fully understood, inflammation and oxidative stress have been suggested as major pathological events initiating or accelerating atherogenesis. Heme oxygenase-1 (HO-1) plays a regulatory role in the inflammatory response by modulating production of pro-inflammatory cytokines, and its expression is mediated by nuclear translocation of transcription factor Nrf-2. This study was to address whether IH would upregulate the expression of pro-inflammatory cytokines via HO-1 expression in endothelial cells in vitro.

**Methods:** EAhy 926 cells were exposed to intermittent normoxia (IN as control) or IH (a 10-min hypoxia [5% $O_2$] followed by a 5-min normoxia [21% $O_2$] for 64 cycles using the BioSpherix OxyCycler C42 system [BioSpherix, Redfield, NY]). IL-6 and IL-8 mRNA expressions were measured by RT-PCR, and protein secreted was measured by ELISA. Cellular activities of GSH-related enzymes such as glutathione peroxidase (GPx) and glutathione reductase (GR) were analysed. Whole cell lysates, cytosolic and nuclear fractions were extracted to perform Western blot for HO-1, Nrf-2, and phospho-ERK.

**Results:** IH increased the production of IL-6 and IL-8 protein without changing the mRNA levels. IH also enhanced the enzyme activities of GPx and GR. On the other hand, IH suppressed HO-1 and Nrf-2 expression, accompanied by the inhibition of ERK phosphorylation.

**Conclusions:** These data suggest an underlying mechanism for OSA subjects on the process of atherogenesis and a potential role of HO-1 in the therapeutic benefit for OSA-related atherosclerosis.

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