Cardiovascular disease

Raised resting heart rate associated with increased mortality risk

A high resting heart rate and an increase in resting heart rate over a decade are associated with a greater risk of death from cancer and other causes as well as cardiovascular disease (CVD), a study from Australia has found.

The study used data from the Melbourne Collaborative Cohort Study that recruited 41,514 participants (59% women), aged 40-69 years, between 1990 and 1994.

Resting heart rate measurements were recorded at baseline for 41,386 individuals and at follow-up, between 2003 and 2007, changes in resting heart rate were analysed for 21,692 participants. Measurements were carried out by trained staff, using Dinamap monitors. A resting heart rate of < 70 beats per minute was classed as normal.

There were 3,618 deaths from cancer, 2,239 from CVD and 2,573 from other causes during a mean follow-up of 22 years. After adjustment for potential confounders, including blood pressure and known medical conditions (but not arrhythmias such as atrial fibrillation as information on these conditions was not available), raised resting heart rate was associated with a higher risk of death. Similar associations were found for cardiovascular death, cancer and other causes of death:

- All causes - hazard ratio (HR) per 10 beats per minute 1.13 (95% CI:1.11-1.15)
- CVD - HR 1.11 (95% CI: 1.07-1.16)
- Cancer- HR 1.10 (95% CI: 1.06-1.13)
- Other causes - HR 1.20 (95% CI: 1.16-1.25)

Similar results were obtained when participants with pre-existing cardiovascular conditions were excluded.

Higher mortality was observed for most cancer sites, including:

- Breast – HR 1.16 (95% CI: 1.03-1.31)
- Colorectal – HR 1.18 (95% CI: 1.08-1.29)
- Kidney – HR 1.27 (95% CI: 1.03-1.57)
- Lung cancer – HR 1.19 (95% CI: 1.10-1.29)

Temporal increases in resting heart rate were associated with higher mortality, particularly for individuals whose resting heart rate increased by more than 15 beats per minute.

Those participants whose resting heart fell from raised to normal had a similar risk to those who maintained a healthy heart rate.

The cancer association was interesting and a possible mechanism for this is that higher resting heart rates reflect higher levels of sympathetic activity which could lead to an increase in factors that stimulate epithelial cell growth and proliferation.

Resting heart rate is a marker of cardiac function and a good indicator of physical fitness and general health. Most studies investigating the association between resting heart rate and mortality have focused on deaths from CVD and measured resting heart rate at only one time point.

The authors concluded that resting heart rate and changes in resting heart rate over a decade are associated with mortality risk and that this risk is not confined to just cardiovascular causes. The authors propose that the monitoring of resting heart rate may be useful in the identification of those at higher mortality risk.

The study authors conclude: 'Elevated resting heart rate measured at a single point is associated with higher risk of death from most causes, including cancer, independently of blood pressure and the main sociodemographic and lifestyle risk factors. Long-term increases in resting heart rate were also associated with higher mortality.

'Resting heart rate monitored during GP visits or using fitness devices could help identify population subgroups at higher mortality risk.'

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Seviiri M, Lynch BM, Hodge AM et al. Resting heart rate, temporal changes in resting heart rate, and overall and cause-specific mortality. *Heart* 2018;104:1076-85

Addiction

Patients prescribed opioids for analgesia at risk of dependence

A systematic review and meta-analysis has estimated that the incidence of iatrogenic opioid dependence or abuse in patients prescribed opioids for pain is almost 1 in 20.

Researchers from the University of Dundee carried out systematic searches of six online databases (Embase, Medline, PubMed, Cinahl Plus, Web of Science, and OpenGrey) to find relevant studies. A 'grey' literature search and a manual reference search of included articles were also undertaken.

The study's objective was to estimate the incidence of iatrogenic opioid dependence or abuse in patients with pain who had been prescribed opioid analgesic therapy.

After reviewing more than 3,000 papers, 12 studies, judged as good or fair quality, that met the inclusion criteria were chosen for analysis. These studies covered a total of 310,408 participants. There was little within-study risk for bias, and no significant publication bias was identified. The main measure used was the event rate i.e. the proportion of the total population developing dependence or abuse.

A random effects model (DerSimonian-Laird method) for data analysis provided a pooled incidence of opioid dependence or abuse of 4.7%. However, the authors did note substantial heterogeneity among study effects and the incidence ranged from 0.2% to 34.2%.

Sensitivity analyses indicated that the diagnostic criteria used for opioid dependence or abuse (i.e. differences between DSM-IV and ICD-9 criteria)