GEMs
GOOD EVIDENCE MATTERS

GEMs of the Week

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What's in this week's issue?

Week of May 15 - 19, 2023

SPOTLIGHT: To Scope or Not to Scope - Are Colonoscopies Still Effective for Colon Cancer Screening?

- Can First-Episode Syncope Increase the Risk of Motor Vehicle Crash?

- Is Strength Training the Key to Decreasing Cancer and Heart Disease?

To Scope or Not to Scope: Are Colonoscopies Still Effective for Colon Cancer Screening?

Effect of Colonoscopy Screening on Risks of Colorectal Cancer and Related Death

Bretthauer M, Løberg M, Wieszczy P, et al. Effect of colonoscopy screening on risks of colorectal cancer and related death. *New England Journal of Medicine*. 2022;387(17):1547-1556. doi:10.1056/nejmoa2208375

KEY TAKEAWAY: Colon cancer screening with screening colonoscopy reduces the risk of colorectal cancer but not cancer-specific or all-cause mortality.

STUDY DESIGN: Randomized control trial

LEVEL OF EVIDENCE: STEP 2

BRIEF BACKGROUND INFORMATION: Globally, colorectal cancer is the 3rd most common type of cancer and is the 2nd leading cause of cancer-related death. Currently screening colonoscopy is the standard of care; however, there has recently been a question regarding its efficacy in risk prevention. There are also other approved methods of screening including stool-based testing.

PATIENTS: Men and women 55–64 years old

INTERVENTION: Screening colonoscopy

CONTROL: No screening colonoscopy

PRIMARY OUTCOME: Risk of colorectal cancer and death from colorectal cancer at 10 to 15 years follow-up

Secondary Outcome: Death from any cause

METHODS (BRIEF DESCRIPTION):

- Men and women 55–64 years old who had not previously undergone colon cancer screening and who lived in Poland, Norway, Sweden, or the Netherlands. The exclusion criteria were diagnosis of or colon cancer-related death before trial entry when referenced via the national registries prior to randomization.
- Study participants were assigned randomly to one of two groups: an invitation to complete screening colonoscopy or no invitation
- Screening was one-time and any lesions seen during screening were removed and biopsied if possible. Cancers that were found were referred for treatment.
- Primary Outcomes: diagnosis of colorectal cancer as defined by cancer in the colon or the rectum. A Kaplan-Meier estimator was used to measure the cumulative risk at 10 years for colorectal cancer and related death in both usual care groups vs. the invited-to-screen groups. Risks were compared using risk ratios, risk differences, and annual incidence ratios. 95% confidence intervals were used. The analysis adjusted for the baseline covariates of the participants to account for any baseline risks of colon cancer in those who underwent screening and those who were invited. A pooled logistic model was used for this adjustment accounting for age, sex, country, assigned study group (invited vs. usual care), and duration of follow-up.

INTERVENTION (# IN THE GROUP): 28,220

COMPARISON (# IN THE GROUP): 56,365

FOLLOW-UP PERIOD: 10 years

RESULTS:

Primary Outcome –

- In the intention-to-treat analysis, at 10 years the risk for colon cancer was lower in the screening group than in the non-intervention group. (RR 0.82; 95% CI, 0.70–0.93; NNI=55).
- In the adjusted per-protocol analysis, when adjusted to evaluate risk prevention if all intervention participants who were invited to screen had undergone screening, the 10-year risk for colon cancer was lower in the screening group than in the non-intervention group (estimated risk 0.69; 95% CI, 0.55–0.83).
- If adjusted to assume all who were invited did screen:
  - 31% decrease in the risk of colorectal cancer (RR 0.69; 95% CI, 0.55–0.83)
  - 50% decrease in its related death (RR 0.50; 95% CI, 0.27–0.77)

Secondary Outcome –

- In the intention-to-treat analysis there was no difference in colon cancer-related death at 10 years or all-cause mortality.
- In the adjusted per-protocol analysis, screening decreased the 10-year risk of colorectal cancer-related death (estimated risk of 0.50; 95% CI, 0.27–0.77).

LIMITATIONS:

- Participation was lower than expected in some of the countries included in this study.
- There may have been a difference in the quality of those doing the colonoscopies in detecting polyps, which was not part of the study's variables.
- The design of this study started enrollment at the population level first as opposed to starting the enrollment process with participation via informed consent, which may have yielded more participation in the end.

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Can First-Episode Syncope Increase the Risk of Motor Vehicle Crash?

Syncope and the Risk of Subsequent Motor Vehicle Crash a Population-Based Retrospective Cohort Study
Redelmeier DA, Raza S. Syncope and the Risk of a Subsequent Motor Vehicle Crash. *JAMA Intern Med*. 2016 Apr;176(4):510-1. doi: 10.1001/jamainternmed.2015.8617. PMID: 26926948.

KEY TAKEAWAY: Patients presenting to the Emergency Department (ED) for first-time syncope have no greater risk of motor vehicle crash (MVC) compared to patients presenting for a diagnosis other than syncope.

STUDY DESIGN: Population-based retrospective cohort study

LEVEL OF EVIDENCE: STEP 3

BRIEF BACKGROUND INFORMATION: Syncope results in 1.3 million visits in the ED annually. Physicians advising to temporarily cease driving, as a result, can pose a financial and psychosocial hardship on the patient. This study was designed to assess the risk of MVC in patients presenting with first-time syncope compared to those presenting without syncope.

PATIENTS: Adult patients

INTERVENTION: First time syncope

CONTROL: No syncope

PRIMARY OUTCOME: Risk of MVC following discharge
Secondary Outcome: Risk of crash in first 30 days following discharge

METHODS (BRIEF DESCRIPTION):

- The study cohort consisted of all EDs within the geographical boundaries of Vancouver Coastal Health.
- Individuals with one or more ED visits with a discharge diagnosis of syncope were included between January 1, 2010, to December 31, 2015.
- Exclusion criteria included those 18 and younger, a prior ED visit of syncope, and those who had been hospitalized for more than seven days.
- The study cohort included 51.3% women and 48.7% men.
- The median age was 54 years old, with an interquartile range of 35–72 years.
- 83.1% held a full driver's license as opposed to a learner or novice license.
- The most frequent comorbidities were hypertension (32.6%), psychiatric disorders (32.5%), and cardiovascular disease (21%).
- Two trained abstractors reviewed medical records of initial syncope ED visits and the data was linked to population-based administrative health data and insurance claims data for all British Columbia.
- The authors adjusted for MVC risk factors such as age group, sex, year, season, and site of an index ED visit in their statistical calculations.

INTERVENTION (# IN THE GROUP): 9,223

COMPARISON (# IN THE GROUP): 34,366

FOLLOW-UP PERIOD: One year

RESULTS:

Primary Outcome –

- The risk of MVC following the index ED visits was similar in both groups (12 vs 14 per 100 person-years, adjusted hazard ratio [aHR] 0.93; 95% CI, 0.87–1.01).

Secondary Outcome –

- The risk of a crash in the first 30 days following index ED visit among syncope patients was not significantly higher than the control group (aHR 1.1; 95% CI, 0.84–1.4).
- Individuals having definite or likely syncope had a lower likelihood of MVC compared to the control group (aHR 0.89; 95% CI, 0.81–0.98).

LIMITATIONS:

- Specific causes of syncope (ventricular tachycardia, cardiac arrest, pulmonary embolism, hypotension) were not accounted for.
- Race/ethnicity, socioeconomic status, individual road exposure data, and license expirations were not included.
- Per the British Columbia Motor Vehicle Act, clinicians are required to report potentially unfit drivers if they continue to drive after being warned, however, most patients in this study had first-episode syncope following discharge and were not subjected to that warning or restriction.

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Is Strength Training the Key to Decreasing Cancer and Heart Disease?

Muscle-Strengthening Activities are Associated with Lower Risk and Mortality in Major Non-Communicable Diseases: A Systematic Review and Meta-Analysis of Cohort Studies

Momma H, Kawakami R, Honda T, Sawada SS. Muscle-strengthening activities are associated with lower risk and mortality in major non-communicable diseases: A systematic review and meta-analysis of cohort studies. *British Journal of Sports Medicine*. 2022;56(13):755-763. doi:10.1136/bjsports-2021-105061

KEY TAKEAWAY: In adults without severe health conditions, muscle-strengthening activities are associated with a lower risk of cardiovascular disease, total cancer, and diabetes.

STUDY DESIGN: Meta-analysis of 16 prospective cohort studies

LEVEL OF EVIDENCE: STEP 3 (downgraded due to low quality prospective cohort studies with significant heterogeneity)

BRIEF BACKGROUND INFORMATION: Strength training is an exercise that focuses on building and preserving skeletal muscle strength. Current World Health Organization (WHO) guidelines recommend adults should engage in muscle-strengthening exercises 2 or more days every week. There have been many investigations on the effects of aerobic exercise on the prevention of premature death and non-communicable diseases, but not on muscle-strengthening activities. The aim of this study is to examine the effects of strength training on risk of non-communicable diseases and mortality in adults.

PATIENTS: Adults without severe health conditions

INTERVENTION: Resistance, strength, weight training, and/or calisthenics

CONTROL: No strength training

PRIMARY OUTCOME: Risk of all-cause mortality, risk of non-communicable diseases (CVD, total cancer, diabetes)

METHODS (BRIEF DESCRIPTION):

- Observational studies carried out among adults 18 years old or older without diagnosed severe health conditions within a minimum follow-up period of two years, which examined the influence of muscle-strengthening activities on the outcomes were included.
- The intervention of muscle-strengthening exercises included resistance, weight, and strength training along with calisthenics.
- No strength training in the comparison group
- Measured outcomes included:
  - All-cause mortality rates among participants.
  - Association between muscle strengthening activities and health outcomes in non-communicable diseases (CVD, total cancer, diabetes, and specific cancer types), with estimated effect provided for any muscle strengthening activity compared with no strengthening activity using random effects model.

INTERVENTION (# IN THE GROUP): Not available

COMPARISON (# IN THE GROUP): Not available

FOLLOW-UP PERIOD: Two to 25 years

RESULTS:

Primary Outcome –

- 30 to 60 minutes of muscle-strengthening activities per week were associated with:
  - 15% lower risk of all-cause mortality (7 studies, n=263,058; RR 0.85; 95% CI, 0.79–0.93)
  - 17% lower risk of CVD (7 studies, n=257,888; RR 0.83; 95% CI, 0.73–0.93)
  - 12% lower risk of total cancer (6 studies, n=540,543; RR 0.88; 95% CI, 0.80–0.97)
  - 17% lower incidence of diabetes (5 studies, n=202,486; RR 0.83; 95% CI, 0.77–0.89)
  - 10% lower incidence of lung cancer (2 studies, n=248,909; RR 0.90; 95% CI, 0.83–0.98)

LIMITATIONS:

- Only two databases were searched, potentially missing relevant studies.
- A small number of studies were included, and these studies were found to have high levels of heterogeneity (I^2>75%).
- The quality of evidence on diabetes was “low” and all other outcomes were “very low”.
- Activities evaluated via interview or self-reported.
- Potential confounders may have influenced studies.

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