Study Protocol

Cancer screening during the COVID 19 pandemic: A systematic review and meta-analysis

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Introduction and PICO question:

Cancer screening is one of the most important public health initiatives worldwide. Screening has been shown to lower the mortality and identify disease at earlier stages for many cancers. In January of 2019 a novel coronavirus, known as Sars-CoV-2, was first discovered in the Wuhan province of China. By March of 2019, this newly discovered coronavirus was deemed a global pandemic by the World Health Organization. This virus causes a severe acute respiratory syndrome with a very high case fatality rate which was quickly spreading worldwide. The disease, known as coronavirus disease of 2019 (COVID-19) caused a worldwide public health crisis of a magnitude for which there is unlikely a comparison. Most countries tried to quarantine their citizens and routine visits to physicians dropped significantly. We chose to systematically review the literature to examine the effects of COVID-19 on worldwide cancer screening.

We formed the study question following a guide which identifies these characteristics: patients or problem, and intervention, comparison group, outcomes, and study design (PICOS).

PICOS question: We examined patients being screened for any cancer worldwide to determine in the rates of screening was found to have changed during the COVID-19 pandemic when compared to previous rates.

Outcomes from cancer screening take many years to evaluate and will have to examine several years henceforth. Presently, we can only examine screening rates. All of our date will come from observational studies.

Protocol

This systematic review was registered through PROSPERO (ID: CRD42021241831). We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Guideline and have a PRISMA checklist.

Search strategy:

We developed our search strategies, using Medical subject heading (MESH) terms and text words which were selected based on common indexing practices. Search terms were compiled and tested repeatedly to produce sensitive searches to capture potentially relevant publications. We searched the following databases: PubMed.gov, Ovid Medline, the Cochrane Library, ClinicalTrials.gov, and Embase from January 1, 2020 to February 10, 2021 without language restrictions. Searches were performed employing the following keywords: cancer screening, lung cancer screening, mammography, breast cancer screening, colonoscopy, colon and rectum cancer, cervical cancer screening, Papanicolaou or PAP testing, prostate specific antigen (PSA), prostate cancer screening, COVID-19, Sars-CoV-2,

and 2019 novel coronavirus. Our search was augmented by author and reference tracking to identify additional studies.

Study selection and inclusion/exclusion criteria

We collect initial references in citation files (using the software Covidence), removed duplicates, and began our screening process for titles and abstracts against eligibility criteria. These abstracts were reviewed for inclusion in initial screening phase followed by the full text screening phase of our systematic review independently by two authors (RAS and MM) Studies were selected for full text review if they contained data on patients screened for any type of cancer during the COVID-19 pandemic and contained comparison data from a time interval just prior to the pandemic. Disagreements among reviewers in the initial abstract screening phase and full text review were resolved by consensus by two authors (RAS and MM) Disagreements among reviewers in the full text screening phase were reconciled by discussion and consensus by a third reviewer (BP).

Inclusion criteria were observational studies of cohorts or cancer registries. We chose studies which included data of screened patient populations both just prior to and during the pandemic (specifically the years of 2019 and 2020). If studies only contained screening rates, we obtained the raw numbers of patients screened by contacting the authors for unpublished data. Studies were excluded if these data were not available.

Exclusion criteria included: studies which did not record the number of patients screened for any cancers during the year 2019 as well as after the pandemic effected their population with lockdown measures. There were no language restrictions. Abstract only papers were excluded, as study design and methods of data acquisition may not be able to be evaluated and reconciled.

Data extraction and quality assessment

Two investigators (RAS, and MM) reviewed all selected studies from phase two of screening and independently evaluated each to become included studies for data extraction. Data to be extracted from studies include study description (e.g., demographics of participants and research setting), methods used to record screening rates, comparison data of screening rates before 2019. Four investigators extracted data from the 33 included studies (RAS, MM, BP, and RB). Two investigators (RAS and BP) independently assessed the quality and risk of bias of all included studies using the Quality Assessment Tool for the Observational, Cohort and Cross Sectional Studies available from the National Institute of Health. Risk of bias was appraised using the Cochrane risk of bias tool for observational studies. Conflicts of interest of study investigators will also be recorded and considered.

Data synthesis

Meta-analysis was considered whenever studies of similar design, participants and outcomes yield quantitative estimates that require pooling to increase precision. It is anticipated that significant heterogeneity will be encountered in the literature found. This heterogeneity can be attributed to multiple known and unknown factors. If possible, subgroup analyses will be conducted to explore the effect of each subgroup designation (covariate) on the observed associations. In particular, we will collect any reported data on age subgroups. If data were sufficient for quantitative analysis, interaction tests and meta-regression techniques will be used to investigate heterogeneity. We will adhere to the PRISMA guidelines when reporting the final findings of our study.