Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Pseudotumor cerebri syndrome associated with MIS-C: a case report

A previously healthy 14-year-old girl (body-mass index 19·2 kg/m²) presented to our hospital (Children's Hospital of Philadelphia, Philadelphia, PA, USA) with 5 days of fever, headache, rash, diarrhoea, and dyspnoea. 2 months previously, she had presented to our emergency department with cough, headache, and myalgias of unknown cause; however, she was discharged without hospital admission.

Initial laboratory assessment upon current presentation showed leukopenia, increased C-reactive protein (34·3 mg/dL) and fibrinogen (657 mg/dL), normal international normalised ratio and partial thromboplastin time. Respiratory failure and septic shock required mechanical ventilation and vasopressors. Chest CT showed diffuse ground glass airspace opacities with subpleural sparing. She was given empiric broad spectrum antibiotics, including 9 days of doxycycline, and hydrocortisone for shock.

Nasopharyngeal and deep endotracheal sampling for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by real-time PCR were negative.

Echocardiogram detected diffuse dilation of the right coronary artery. Presumed atypical Kawasaki shock syndrome was treated with intravenous immunoglobulin and intravenous methylprednisolone.

She was extubated after 6 days of ventilation, and then she manifested a new esotropia. Visual acuity, colour vision, and pupils were normal. No conjunctival injection or anterior segment inflammation was present. A right-eye abduction deficit, consistent with an abducens palsy, was present. Dilated fundus examination revealed bilateral papilloedema with left-disc haemorrhages. Neurological examination was otherwise normal. MRI of the brain and magnetic resonance venogram revealed abnormalities consistent with increased intracranial pressure (appendix pp 1–3). Lumbar puncture on day 11 after admission to hospital revealed an opening pressure of 36 cm H_20, two white blood cells per µL, and normal glucose and protein. Acetazolamide 250 mg twice daily and an oral prednisone taper were prescribed.

After 14 days in hospital, the patient was discharged. After discharge, IgG qualitative testing returned positive, suggestive of SARS-CoV-2 infection. 2-month follow-up revealed resolution of papilloedema, disc haemorrhages, and abducens palsy. She reported non-compliance with the prescribed acetazolamide.

Multisystem inflammatory syndrome in children (MIS-C) is a recently reported paediatric syndrome associated with SARS-CoV-2 infection.[1] Based on our patient's papilloedema, abducens palsy, normal brain parenchyma, and increased cerebrospinal fluid opening pressure with normal constituents, in the setting of MIS-C, she meets criteria for secondary pseudotumor cerebri syndrome (PTCS).[2,3] PTCS might be primary (idiopathic intracranial hypertension); however, inflammatory and infectious conditions have been implicated as secondary causes.[4]

Although cerebrospinal fluid dynamics were altered in our patient with MIS-C, the mechanism remains unclear. Doxycycline was thought to be non-contributory because doxycycline-related PTCS typically occurs after 1–2 months of use.[3] As our understanding of MIS-C evolves, an ocular fundus examination might be required as part of a multi-system approach to assess patients with suspected MIS-C. PTCS is a potentially vision-threatening condition and should be considered in this clinical setting.

We declare no competing interests.

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Sex differential in COVID-19 mortality varies markedly by age

In the COVID-19 pandemic, we have emphasised the importance for epidemiological data to be presented by age and sex groups.[1,2] This call has also been made by the European Association of Science Editors[3] and *The Lancet*.[4] Without these data, the public are unable to make truly informed choices about their own disease risk, and public policy responses cannot be specifically targeted.

The prevailing view is that although the number of male cases is not dissimilar to the number of female cases, men have about twice the risk of death from COVID-19, leading to a range of hypotheses, from lifestyles to differences in chromosomal structure.[5–7] Although graphs describing disaggregated national statistical data can be found on the Global Health 50/50 website,[8] the underlying data are not shown and, to the best of our knowledge, have not been described in the literature.

We examined the sex ratio through the life course to see if the COVID-19 mortality sex-differential was the same at every age. We analysed data collated by the National Institute for Demographic Studies from national statistical agencies across England and Wales, France, Germany, Italy, Netherlands, Portugal, Korea, and Spain, covering an estimated population of 194 349 591 men and 201 715 364 women from the beginning of the pandemic until June 21, 2020.[9] Belgium and USA were not included due to presentation of data in different age categories.

77 652 men died and 59 591 women died. The overall male to female mortality sex ratio per 100 000 population was 1·4 (crude ratio 1·3). This ratio was not equal at all ages. For example, for people aged 0–9 years the ratio was 0·81. The ratio was 1·9 in the 40–49 years age group, 2·3 in the 50–59 year age group, 2·6 in the 60–69 years age group, and 1·65 in people older than 80 years (appendix p 1).

There was some variation across countries, although broadly the pattern was similar, and the numbers became too small for clear-cut interpretation (appendix p 3).

These data alter our understanding of male–female differences; the relationship is not straightforward, and efforts should now be made to understand risk based on the interaction of sex and age, along with other factors.

Hypotheses based on risk factors that are known to change with both sex and age seem to be the most probable explanations for the differences observed. These include differences in occupation, lifestyle (including smoking and alcohol use), medical comorbidities, or use of medications. These explanations reflect social and cultural factors related to gender rather than the biology of sex. Genetic explanations will need to consider the interaction of age, sex, and the risk factors previously mentioned through the life course, including gene expression and epigenetics.

Disaggregated data allow public health authorities to tailor mortality prevention strategies to prioritise those most at risk. Although we are developing indirect standardisation methods,[10] we urge nations to supply age and sex specific data, not only for an accurate description of the pandemic, but also for the calculation of directly standardised rates internationally—something WHO cannot do globally for lack of comprehensive sex and age group specific data.

We declare no competing interests.

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WSO and WHF joint position statement on population-wide prevention strategies

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In 2008, Rod Jackson and colleagues[1] proposed that prevention strategies for high-risk cardiovascular disease, based on screening individuals at high risk of cardiovascular disease, would deliver large benefits for the population. Simon Capewell[2] cautioned that these strategies could mislead health professionals and politicians into thinking they can tick the box reading mission accomplished and, with screening completed, cardiovascular disease prevention would be resolved. Both sides of this debate were based on assumptions and therefore did not reach consensus, but the high-risk approach to the prevention of cardiovascular disease has since been widely recommended and implemented.

There is reliable evidence from the Inter99 randomised controlled trial,[3] which included 59 616 people aged 30–60 years followed up for 10 years, and a Cochrane meta-analysis[4] of 15 randomised controlled trials, totalling 251 891 adults, that screening individuals in the general population for the risk of cardiovascular disease and risk factors (even with lifestyle counselling, as in the Inter99 trial[3]) has no significant effect on the incidence and mortality of ischaemic heart disease and stroke. At a population level, the age-standardised incidence and mortality of cardiovascular disease (including stroke) were decreasing before the implementation of high-risk prevention strategies, but have shown less decline since 2010 than the decline during the past 25 years.[5]

In some countries, such as the UK, the Netherlands, the USA, and New Zealand (specifically the Māori and Pacific people), the incidence and mortality of cardiovascular disease is increasing, particularly in middle-aged individuals. Furthermore, there is a paucity of robust

See **Online** for appendix