

# Letters to the editor

## Sudden unexplained deaths and COVID-19: is there more than what meets the eye?

An early mid-summer morning in Mangalore, a sleepy coastal town in south Karnataka. The pandemic that had unleashed its full fury a few months ago was now coming back ebbing and surging in waves. The emergency department in the city's premier hospital was unusually calm. Blare of the ambulance shattered the fragile peace and soon the triage was a flurry of activity. It didn't take long for most of the residents to conclude that the middle-aged woman wheeled in was wheeled in too late.

The deceased woman was apparently in pink health, even tending to her husband, who was hospitalised a week earlier with COVID pneumonia. The woman herself had tested negative for COVID. That fateful morning, she had complained of chest pain that culminated in bouts of vomiting, following which she collapsed.

How often have we seen this scene being replayed in the past year, a period when emergency care was being redefined by this pandemic? Sudden unexplained death, though not a rarity, is being witnessed with despairing regularity, defying rationale and reasons. The cause of her death, like millions before her, will in all likelihood stay wrapped inside those sheets of white.

COVID has baffled and humbled the medical fraternity simply by showing us how many ways it could kill. It has led to sudden deaths in some, squeezed out the lungs in the majority with intractable hypoxia, clogged the conduits of life in others, while the rest just withered away to a slow death marred with complications. Most of the deaths attributable to COVID have been largely accounted for. However, a common clinical observation that merits justification and stands to be supplanted with evidence is the spurt in sudden unexplained deaths in the midst of this pandemic. Many unfortunate victims, as with our patient, are COVID negative but are primary contacts or caretakers of COVID-positive patients.

Although direct causal association of sudden cardiac deaths (SCD) and COVID-19 remain unproven as of today, a large body of data suggests a plausible association with an increased incidence of SCD in both community and hospital settings.<sup>1,2</sup> Though asymptomatic carriers of COVID-19 among close contacts of confirmed cases are a well-recognised entity, the epidemiological significance, the clinical relevance and the prevalence of thromboembolic disease among this specific populace remain obscure. Administration of enhanced anticoagulation for patients with high risk is recommended for those with severe COVID-19,<sup>3</sup> as is prophylactic anticoagulation for all hospitalised COVID-19 patients.<sup>4</sup> Patients with mild disease when screened meticulously with

CT pulmonary angiography (CTPA) plus CT venography (CTV) showed thrombosis as high as 82.6%.<sup>5</sup> However, no specific monitoring, risk stratification or interventional protocols with prophylactic anticoagulants is advocated for close contacts of confirmed COVID-19 cases or the asymptomatic.

Collating clinical observations and factual contexts with a larger body of evidence to probe this possible complication (thromboembolic) through remote association (asymptomatic primary COVID contacts) with deadly implications (sudden unexplained deaths) is a dire need of the hour.

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## The effect of hydroxychloroquine on non-alcoholic fatty liver disease among rheumatoid arthritis patients

Non-alcoholic fatty liver disease (NAFLD) is common among rheumatoid arthritis (RA) patients.<sup>1</sup> The prevalence of NAFLD in RA patients was reported to be 20.3%, while the global prevalence of NAFLD in the general population was 25%.<sup>1</sup> The risk factors of NAFLD include patients' age, gender, metabolic conditions (hypertension, diabetes mellitus, obesity), race and ethnicity. The effects of conventional disease-modifying anti-rheumatic drugs (cDMARDs) on NAFLD were inconsistent. A recent report revealed no significant association between cDMARDs and NAFLD,<sup>2</sup> while other literature demonstrated a significant association between the cumulative dose of methotrexate and NAFLD.<sup>3</sup>

**Table 1** Demographic of RA patients on cDMARDs and correlation between variables and CAP

| Variables  | n (%)      | Median (IQR)        | CAP (dB/m)    |         |         |
|--|------------|---------------------|---------------|---------|---------|
|  |            |                     | Median (IQR)  | r-value | P-value |
| Age (years) <sup>a</sup>                             | 40 (100.0) | 51.2 (10.76)*       |               | −0.040  | 0.808   |
| Gender <sup>b</sup>                                  |            |                     |               |         | 0.042   |
| Male   | 5 (12.5)   |                     | 191.0 (82.25) |         |         |
| Female   | 35 (87.5)  |                     | 238.0 (68.00) |         |         |
| Weight (kg) <sup>a</sup>                             | 40 (100.0) | 59.6 (10.93)*       |               | 0.282   | 0.082   |
| Height (m) <sup>a</sup>                              | 40 (100.0) | 1.6 (0.06)*         |               | −0.064  | 0.699   |
| BMI (kg/m <sup>2</sup> ) <sup>a</sup>                | 40 (100.0) | 24.2 (4.13)*        |               | 0.288   | 0.076   |
| DAS-28 score <sup>a</sup>                            | 40 (100.0) | 3.0 (1.19)*         |               | 0.157   | 0.339   |
| Duration of disease (months) <sup>a</sup>            | 40 (100.0) | 41.1 (32.27)*       |               | 0.066   | 0.689   |
| Rheumatoid factor <sup>c</sup>                       |            |                     |               |         | 0.408   |
| Negative   | 14 (35.0)  |                     | 232.6 (60.82) |         |         |
| Positive   | 26 (65.0)  |                     | 236.9 (49.27) |         |         |
| Anti-CCP <sup>c</sup>                                |            |                     |               |         | 0.269   |
| Negative   | 22 (55.0)  |                     | 235.9 (60.19) |         |         |
| Positive   | 18 (45.0)  |                     | 234.7 (43.96) |         |         |
| MTX cumulative dose (mg) <sup>a</sup>                | 36 (90.0)  | 1435.0<br>(1669.38) |               | −0.040  | 0.821   |
| LEF cumulative dose (g) <sup>a</sup>                 | 9 (22.5)   | 21.5 (19.95)*       |               | 0.100   | 0.798   |
| SSZ cumulative dose (g) <sup>a</sup>                 | 24 (60.0)  | 1342.0<br>(2023.50) |               | −0.165  | 0.441   |
| HCQ cumulative dose (g) <sup>a</sup>                 | 12 (30.0)  | 185.4 (224.45)      |               | −0.782  | 0.004   |
| Albumin (g/L) <sup>a</sup>                           | 40 (100.0) | 38.0 (5.00)         |               | 0.114   | 0.491   |
| Bilirubin (umol/L) <sup>a</sup>                      | 40 (100.0) | 10.8 (5.32)*        |               | −0.170  | 0.302   |
| Alanine transaminase (U/L) <sup>a</sup>              | 40 (100.0) | 19.5 (12.40)        |               | 0.115   | 0.484   |
| Alkaline phosphatase (U/L) <sup>a</sup>              | 40 (100.0) | 79.5 (20.07)*       |               | 0.014   | 0.931   |
| Alpha-fetoprotein (IU/mL) <sup>a</sup>               | 40 (100.0) | 1.2 (1.28)          |               | 0.171   | 0.298   |
| Aspartate transaminase (U/L) <sup>a</sup>            | 40 (100.0) | 20.0 (5.75)         |               | 0.028   | 0.868   |
| C-reactive protein (mg/L) <sup>a</sup>               | 40 (100.0) | 2.3 (10.60)         |               | 0.293   | 0.071   |
| ESR (mm/hour) <sup>a</sup>                           | 40 (100.0) | 28.0 (35.50)        |               | 0.278   | 0.086   |
| White blood cell (x10 <sup>3</sup> u/L) <sup>a</sup> | 40 (100.0) | 6.5 (2.55)          |               | 0.447   | 0.004   |
| Haemoglobin (g/dL) <sup>a</sup>                      | 40 (100.0) | 12.4 (1.20)         |               | −0.156  | 0.342   |
| Platelet (x10 <sup>3</sup> u/L) <sup>a</sup>         | 40 (100.0) | 312.7 (90.30)*      |               | 0.219   | 0.180   |
| Total cholesterol (mmol/L) <sup>a</sup>              | 40 (100.0) | 5.0 (1.08)*         |               | −0.083  | 0.617   |
| Triglyceride (mmol/L) <sup>a</sup>                   | 40 (100.0) | 1.2 (0.63)          |               | 0.218   | 0.084   |
| High-density lipoproteins (mmol/L) <sup>a</sup>      | 40 (100.0) | 1.5 (0.39)*         |               | −0.130  | 0.429   |
| Low-density lipoproteins (mmol/L) <sup>a</sup>       | 40 (100.0) | 3.0 (0.79)*         |               | −0.088  | 0.592   |
| Gamma glutamyl transferase (U/L) <sup>a</sup>        | 40 (100.0) | 20.0 (22.75)        |               | 0.024   | 0.887   |
| Fasting blood sugar (mmol/L) <sup>a</sup>            | 40 (100.0) | 5.1 (0.78)          |               | 0.173   | 0.293   |
| International normalised ratio <sup>a</sup>          | 40 (100.0) | 1.0 (0.04)*         |               | −0.035  | 0.830   |
| CAP score (dB/m)                                     | 40 (100.0) | 235.3 (52.9)*       |               |         |         |
| Steatosis grading                                    |            |                     |               |         |         |
| S0 (150–238)   | 23 (57.5)  |                     |               |         |         |
| S1 (239–260)   | 6 (15.0)   |                     |               |         |         |
| S2 (261–290)   | 6 (15.0)   |                     |               |         |         |
| S3 (>290)  | 5 (12.5)   |                     |               |         |         |

RA, rheumatoid arthritis; cDMARDs, conventional disease-modifying antirheumatic drugs; CAP, controlled attenuation parameters; dB, decibel; m, meter; IQR, interquartile range; BMI, body mass index; DAS28, disease activity score-28; anti-CCP, anti-cyclic citrullinated peptide; MTX, methotrexate; LEF, leflunomide; SSZ, sulfasalazine; HCQ, hydroxychloroquine; ESR, erythrocyte sedimentation rate  
<sup>a</sup> Spearman's correlation; <sup>b</sup> Mann-Whitney test; <sup>c</sup> independent t-test presented as mean (standard deviation) \* presented as mean (standard deviation)

Liver biopsy remains the gold standard to diagnose NAFLD. However, liver biopsy is an invasive procedure. Controlled attenuation parameter (CAP) is a non-invasive imaging modality in estimating liver steatosis using a FibroScan. A recent review showed good correlation between CAP and hepatic steatosis in chronic liver disease with various aetiologies.<sup>4</sup>

165 patients with RA were screened, being aged between 18 and 70 and who attended a rheumatology clinic at Hospital Sultanah Bahiyah between Mar 2019 and February 2020, fulfilling the American College of Rheumatology (ACR) 1987 or ACR/European League Against Rheumatism 2010 classification criteria for RA. The participants were being treated with at least one cDMARD. Patients who had hepatitis B or C, hepatocellular carcinoma, known fatty liver, chronic liver disease, who consumed alcohol more than 20g daily, were obese, had a history of biologics administration, and pregnant women were excluded (n=122). Of 43 eligible patients, three patients missed their appointment so ultrasonography was performed in only 40 patients by using FibroScan (Echosens, Paris, France) to detect NAFLD by measuring the CAP score and steatosis grading.<sup>5</sup> The mean CAP was  $235.3 \pm 52.9$  dB/m with 23 (57.5%) in steatosis grade 0, 6 (15.0%) in grade 1, 6 (15.0%) in grade 2 and 5 (12.5%) in grade 3 (Table 1). We observed a statistically significant high negative correlation between hydroxychloroquine (HCQ) administration and CAP ( $r_s = -0.782$ ,  $P = 0.004$ ). There were no significant differences between other cDMARDs and CAP; methotrexate ( $r_s = -0.040$ ,  $P = 0.821$ ), leflunomide ( $r_s = 0.100$ ,  $P = 0.798$ ) and sulfasalazine ( $r_s = -0.165$ ,  $P = 0.441$ ). The mean alanine transaminase in the steatosis and non-steatosis group were  $23.9 \pm 10.56$  (U/L) and  $20.0 \pm 9.64$  (U/L) respectively. The prevalence of metabolic syndrome in the steatosis and non-steatosis group showed no significant difference [ $\chi^2(1, N=40) = 0.235$ ,  $P = 0.627$ ].

Our prospective observational study is the first to demonstrate a lower CAP among RA patients who were treated with HCQ. HCQ is an antimalarial not only used in reducing inflammatory process in rheumatic diseases; its effect on metabolic and cardiovascular benefits were well established. Meta-analysis revealed HCQ had a positive outcome in lowering total cholesterol, low density lipoprotein, triglyceride, the incidence of diabetes mellitus and cardiovascular events.<sup>6</sup> These positive effects may also impact to a lower CAP as the risk factors for NAFLD were also reduced by HCQ simultaneously. In spite of our sample size being small, a significant strong negative correlation was found between HCQ administration and CAP. Future study is required to clarify this association.

In conclusion, HCQ may be a promising protective factor for NAFLD among RA patients. Even though the efficacy of HCQ in treating RA is low, clinicians may consider HCQ as a treatment option for RA patients who have risk factors for NAFLD.

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#### parkrun – more than a run in the park

I would like to thank the *JRCPE* for the recent editorial by Jacunski, Melville and Currie on exercise and its importance.<sup>1</sup> As a public health student and professional, I wholeheartedly agree that ‘now is the time to engage’;<sup>1</sup> we must strive for swift policy and societal change to encourage uptake of exercise and remove barriers to participation.

The authors briefly mention parkrun in the UK,<sup>1</sup> a perfect example of how we can encourage people to exercise in a supportive environment. In fact, parkrun is international (<https://www.parkrun.com>), operating in over 20 countries.<sup>2</sup> Since 2004, parkrun has grown from its humble beginnings in Bushy Park (London, UK) to become a global movement of free, weekly, volunteer-led, timed 5 km runs (or walks).<sup>3</sup> Therefore, RCPE Fellows and Members outwith the UK can also participate, volunteer or signpost their patients to parkrun (when restrictions allow and parkrun resumes). There is also the 2 km junior parkrun (held on Sunday mornings, for children aged 4–14 years), which can inspire the next generation to be active.<sup>3</sup>

There is a growing evidence base regarding the benefits of parkrun.<sup>4</sup> For example, findings from a scoping review reveal that parkrun participants demonstrate sustained

improvements in physical activity levels, fitness and mood, with improvements increasing with increasing parkrun participation (for a lay summary, see: <https://blog.parkrun.com/uk/2020/11/20/evidence-on-the-reach-and-impact-of-parkrun-a-review>).<sup>5</sup> Encouragingly, improvements are largest for those who are less active when they registered with parkrun.<sup>5</sup> Additionally, parkrun reaches those traditionally underrepresented in physical activity and organised sports, such as women and people who are less active.<sup>5</sup>

With convincing evidence of mortality benefits for runners versus non-runners (even if running is infrequent/slow-paced),<sup>6</sup> and the additional advantages of parkrun (including its social, inclusive nature, with emphasis on participation rather than competition), I encourage readers to try out parkrun and spread the word.

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## Levetiracetam-induced systemic lupus erythematosus or simply a drug-induced rash?

Jadhav et al. offered very little evidence to support their hypothesis, that the patient, they reported, had levetiracetam-induced systemic lupus erythematosus.<sup>1</sup> The case report does not satisfy the 2019 European League Against Rheumatism/American College of Rheumatology classification criteria for systemic lupus erythematosus.<sup>2</sup> In fact, apart from the positive ANAs, there were no other features to suggest lupus as the rash was nonspecific and no biopsy was performed. Prevalence of positive ANAs in the US population of individuals aged 12 years and older was 13.8% and increased with age.<sup>3</sup> The reported patient was 62 years old and it was not clear when the ANAs became positive. The patient has also previously received phenytoin and valproate and both drugs are known to cause a positive ANA.<sup>4</sup> Another possible cause for a positive ANA in this case is hypothyroidism.<sup>5</sup>

The patient was asymptomatic apart from the rash and there was no other organ involvement. Therefore, the label 'systemic' was inappropriate.

Antihistone antibodies are present in more than 95% of patients with drug-induced lupus and the patient reported does not have positive antihistone antibodies.<sup>6</sup>

In conclusion, the patient reported by Jadhav et al. does not have levetiracetam-induced systemic lupus erythematosus but simply a drug-induced rash.

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### Authors' reply

We thank Dr Jawad for his feedback on our case report.<sup>1</sup> It is an accepted fact that classification criteria may not always be relied upon for diagnosis of systemic lupus erythematosus (SLE).<sup>2</sup> The reason for diagnosing this case as SLE has already been detailed in the discussion section of the article.

The skin lesions in our patient were in keeping with SLE. Though a biopsy can be done in suspicious cases, it is not absolutely necessary for diagnosis of SLE. Hence, in our patient a biopsy was deferred.

Though ANA by IF can be positive in hypothyroidism and even in normal population, strong titres of the antigen as seen in this patient are highly suggestive of SLE.<sup>3</sup> The ANA picture in drug-induced lupus usually has a homogenous pattern, as in this patient. Absence of antihistone antibody does not rule out drug-induced lupus. They are present in only 75% of cases of drug-induced lupus.<sup>4</sup>

We do acknowledge Dr Jawad's concern regarding labelling this diagnosis as SLE when there was no systemic involvement. It could be debated that, alternatively, a diagnosis of subacute cutaneous lupus erythematosus or discoid lupus erythematosus could have been more appropriate.



Clinically, the skin lesions were in the form of plaques that were long standing. The skin lesions did not flare further even when the drug was continued. In the case of an allergic drug eruption, the lesions would show worsening with continuous exposure to the drug. Hence, the lesions were unlikely due to drug reaction. Once the clinical dermatological diagnosis was certain, the temporal relation between starting/stopping of levetiracetam consumption and onset/regression of the skin eruption was highly suggestive of a cause–effect relationship.

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### The rationale for preferential primary percutaneous coronary intervention in the elderly

The rationale for preferential use of primary percutaneous coronary intervention (PPCI) in the elderly is beyond dispute<sup>1</sup> because, in some respects, the benefit/risk profile of PPCI is more favourable in the old than in the young. One of the reasons for that difference is that the alternative to PPCI, namely thrombolysis, is associated with greater risk of intracranial haemorrhage<sup>2</sup> and haemorrhagic cardiac tamponade, respectively, in the old than in the young. The rationale is that age-related friability of cerebral vasculature is a risk factor for thrombolysis-related intracranial haemorrhage, and the age-related incidence of aortic dissection (AD)<sup>3</sup> (which can have a STEMI-like clinical presentation)<sup>4</sup> places the elderly at greater risk of haemorrhagic complications of AD-related inappropriate thrombolysis such as cardiac tamponade.

Unfortunately, the time constraints of 'door-to-balloon time' make no allowance for screening for AD in prospective candidates for PPCI. Nevertheless, clinicians can make good that deficit in due diligence by testing every prospective PPCI candidate for D-dimer blood levels, so as to raise the index of suspicion for AD, given the fact that AD is associated with raised D-dimer levels.<sup>5</sup> Even in the event of eventual percutaneous coronary intervention, an audit of good practice can be made by evaluating all post-PPCI STEMI-like patients with raised D-dimer levels for clinical and echocardiographic stigmata of AD. That risk assessment should also include an evaluation for clinical and echocardiographic stigmata of

pulmonary embolism (PE) (including risk factors for PE such as deep vein thrombosis), given the recognition that PE, too, can have a STEMI-like presentation.<sup>4</sup> In its own right PE can also be associated with raised D-dimer levels.<sup>5</sup> The importance of including STEMI-like AD in the differential diagnosis of acute myocardial infarction is that timely operative repair (for AD) can be life-saving, even if it is delayed by the detour to the catheter lab.<sup>4</sup> The rationale for recognition of the PE origins of PE-related paradoxical coronary embolism is that adjunctive anticoagulation has the potential to mitigate the risk of subsequent multiorgan paradoxical embolism. Also in the context of paradoxical coronary embolism attributable to PE, the alternative to anticoagulation could be the use of adjunctive thrombolysis to relieve the clot burden in the pulmonary circulation, especially in patients who have haemodynamic compromise.<sup>4</sup>

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### Keeping calm with cadaveric dissection in medical curricula

We read with interest the recently published article by Zubair et al. that studied the psychological impact of cadaveric dissection on first-year medical students at two teaching hospitals in Lahore, Pakistan.<sup>1</sup> Anatomy is considered a cornerstone of basic sciences in medicine and, as a result, incorporated in the foundation years of medical curricula. As the authors rightfully indicated, cadaveric dissection provides a unique role in learning about the human structure and function. The authors concluded that symptoms of acute stress disorder (ASD) were present in the cohort involved with first-time dissection and this was particularly more apparent in female students. We agree that the presence of ASD symptoms may lead to detrimental effects in learning among the cohort of junior medical students and support the notion that preparedness and possible desensitisation may help reduce these symptoms.

**Figure 1** *Dr Nicolaes Tulp's Anatomy Lesson*, Rembrandt van Rijn, 1632



Image source: <https://www.mauritshuis.nl/en/explore/the-collection/artworks/the-anatomy-lesson-of-dr-nicolaes-tulp-146>

While we acknowledge the unique value of this study, we would like to share our previous findings on the role of cadaveric dissection in a modern medical curriculum in Australia.<sup>2</sup> This study involved 133 second-year students in a graduate-entry medical programme. Our results indicated the majority of students (75.4%) had a positive perception about learning anatomy through cadaveric dissections. We found that students who had a positive perception felt dissection made learning more interesting and that they would be disadvantaged if they did not engage in the activity. Opposed to the findings of Zubair et al., only a minority of students (15.8%) in our study considered cadaveric dissection as stressful. A subsequent study at our institution explored the utility of a novel adaptation where dissection protocols were crafted in the form of procedure-based dissections replicating surgical procedures, and found that medical students perceived this to be a more thorough, enduring and contextual learning experience that could be translated and applied into clinical practice.<sup>3</sup>

We recognise that other factors such as differences in study methodology, medical curriculum and teaching environment as well as participant demographics may result in unique challenges and differences in study findings. For instance, in contrast to the mean age of 19 in the study by Zubair et al., our graduate-entry medical school enrolls students with a mean age of 21.3 years (based on 2011–2013 cohort data).

The evolution of technology has also enhanced teaching mediums via audiovisual and interactive platforms, which inevitably have led to a growing number of potential alternatives to cadaveric dissection. Despite this, we feel that cadaveric dissection in this discipline should be maintained. The preparation and timing of introducing this activity to students may be crucial in maximising its value and minimising untoward experiences.

As medical educators, we agree that there is a need to improve student preparedness and resilience when faced with potentially challenging learning environments and adversity. Teachings of anatomy through cadaveric dissection have stood the test of time, as evidenced by its embellishment by famed artists but more importantly its teachers.

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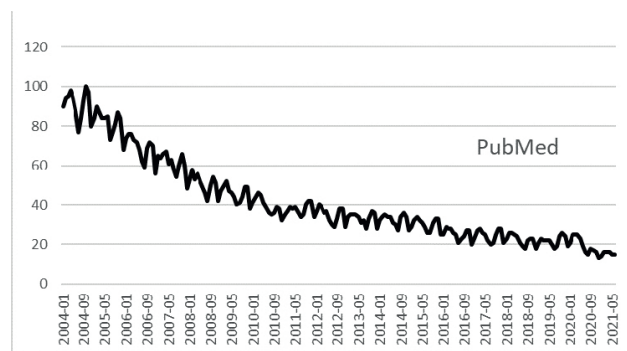
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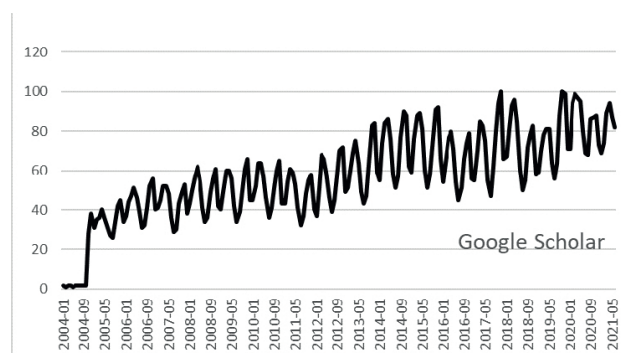
## Is PubMed coming to an end?

The advancement of the electronic era has resulted in the creation of various databases on the World Wide Web that provide scholarly services, for example Google Scholar, Scopus and PubMed.<sup>1</sup> PubMed is an online free searchable database that has the goal of enhancing the sharing of publications in the life and biomedical sciences. Though there are different opinions on the limitations of this database from a coverage point of view,<sup>2</sup> in this letter, I wish to bring a different perspective regarding this database. PubMed includes millions of citations and abstracts from scientific publications and links to articles accessible from different outlets.<sup>3</sup> PubMed has been managed by the National Center for Biotechnology Information in the United States and has been accessible online since 1996. Based on the most recent 17 years (2004 to June 2021) data obtained from the Google Trends database<sup>4</sup> show PubMed was a common topic in Google searches all around the globe.

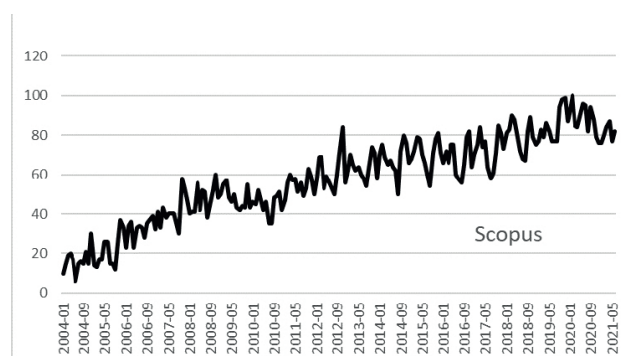
However, the visualisation of the data in Figure 1 (Part A) reflects a marked withdrawal of the search interest. Here, the horizontal axis of the chart represents time (Year-Month), while the values on the vertical axis reflect search interest compared with the chart's greatest interest point. While a score of 100 represents the greatest popularity, a score of 50 indicates that

**Figure 1** Worldwide searching trend over time

Part A



Part B Google Scholar



Part B Scopus

it was half as popular. The PubMed topic lost more than 80% of its popularity over time, with the popularity scores declining from near 100 in early 2004 to near 15 in early 2021.

Part B of the chart, on the other hand, shows a comparable benchmark for two additional scientific databases, Google Scholar and Scopus, over the same time period. In contrast to PubMed, Scopus and Google Scholar are growing in popularity. Lower search popularity implies that fewer academics use PubMed, although they do utilise alternative databases. This calls PubMed's value into doubt. Based on this search popularity approach, we tend to get the same evidence for limitations of this database as was concluded by previous investigators<sup>2</sup> with a coverage approach.

Authors' willingness to submit their work to a PubMed-indexed journal may be influenced by this dropping popularity over time. As a result, journals may be hesitant to seek indexing, resulting in its more limited coverage in the future.

With this, it can be suggested that the PubMed policy needs to be reviewed. It will perish if it does not adopt a competitive strategy. Hence, in a competitive setting among modern scientific databases, the criterion proposed in this study supports upgrading the services to publishers, research and educational institutes, and individual scholars, as well as professional branding and marketing, to succeed.

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#### Point-of-care ultrasound assessment during COVID-19: scanning the future?

The COVID pandemic in March 2020 presented many challenges to the NHS acute assessment units; they were burdened with additional patient load and challenges in rapidly identifying and isolating suspected COVID-19 patients. Sometimes moving a potential COVID-19 patient for a simple chest X-ray incurred significant delays and risked viral spread. Could there be a better way than getting a routine chest X-ray?

Ultrasonography use to rapidly assess both lung and cardiac function at the bedside – commonly known as point-of-care ultrasound (POCUS) – can be an alternative. In adult intensive care settings POCUS is widely practised. However, this is not commonly performed in paediatrics, with adolescents or indeed in other adult ward settings, likely due to the slower accumulation of evidence, clinical confidence, initial cost and availability of ultrasound machines. Recently, POCUS support increased with the production of a European Consensus Guideline on POCUS<sup>1</sup> and ongoing evidence.<sup>2</sup>

At the beginning of the pandemic, in March 2020, we identified the use of POCUS as a major target, hoping to reduce the need for subsequent chest X-rays in the paediatric and adolescent unit of Norfolk and Norwich University Hospital. In a collaboration between the Norwich Academic Training Office and the Department of Paediatrics, a POCUS Device Butterfly IQ was purchased. The device was used by clinicians with training to scan predominantly lungs and heart.<sup>3</sup> The academic lead for the project ran training sessions in POCUS to introduce the concept of bedside ultrasound to the acute assessment unit staff. Staff support was strongly positive, and as a result plans were introduced for a rolling POCUS education programme. This brief introduction mirrored the CACTUS curriculum, focusing on ultrasound physics, vascular access, and abdominal, cardiac and lung imaging.



The simple design and easy connection to an iPhone or iPad made it far easier to perform POCUS rapidly at the bedside while enabling disposable cover use and safe cleaning. Crucially in the early days of the pandemic we were able to use the ultrasound results and isolate children with suspicious chest signs prior to their COVID-positive PCR swab result. Additionally, ultrasound was used for vascular access, monitoring patients with pneumothoraces and pleural effusions. This reduced further chest radiographs, exposure to radiation and risk of nosocomial COVID-19 spread.

A POCUS ultrasound standard operating procedure guideline was written to formalise governance processes and guide its implementation into regular use. We hope to highlight the utility of portable ultrasound but also emphasise the impact joint working between clinical and academic teams can make.

As a result of the overwhelming support received, we propose that such experiences, resulting from necessity following the pandemic, highlight the positive effect of POCUS, which can be extended in the adult population. More importantly, they also highlight the need for such training in our medical schools and routine incorporation of POCUS with clinical assessment.<sup>4</sup> We agree with Naik and Chakrapani that the pandemic offers the opportunity to base decisions on clinical examination,<sup>5</sup> but we propose that POCUS can be considered as an extension of this bedside clinical examination.

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## An alarm bell: increase in MDR and XDR enteric fever over ten years

The recent article by Saleem et al. described the alarming increase in multidrug-resistant (MDR) and extended drug-resistant (XDR) enteric fever cases from none to 16% and 40% respectively over ten years in a teaching hospital.<sup>1</sup> This is certainly one of the indicators of rising widespread injudicious and empirical use of antimicrobials in their cohort of patients. Part of the contributory factors to empirical antimicrobial usage and evolving antimicrobial resistance to typhoid and paratyphoid could be the isolated use of serological tests like Widal and Typhidot for diagnosing typhoid without culture-based diagnostics. Such serological tests have low sensitivity and specificity and they cannot provide guidance about antimicrobial susceptibility but are still widely used in the community for diagnosing enteric fever.<sup>2</sup> These serological tests can even be falsely positive with COVID-19 infection.<sup>3</sup> In resource-poor countries of South East Asia, healthcare is fragmented and sometimes patients tend to change their providers quickly, looking for a rapid fix to their problem without waiting for the confirmation of diagnosis. The healthcare providers in such areas are at times compelled to treat moderately unwell patients in the community empirically based on these serological tests without opting to pursue the diagnoses more rigorously by culture and molecular methods like polymerase chain reaction using blood, urine and faeces specimen.<sup>4</sup> There is certainly need for more education about the importance of culture and molecular diagnostic methods both to confirm the diagnosis and to guide antimicrobial selection in the community settings, otherwise unfortunately such disturbing patterns of antimicrobial resistance would continue to evolve when reviewed from a teaching hospital microbiological laboratory perspective, having a referred cohort of unwell hospitalised patients.

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