

PERSPECTIVE

Poor metabolic health is a major issue for increased COVID-19 mortality in BAME patient groups

Editorial Note

Type 2 diabetes mellitus and hypertension are the most common comorbidities in patients with coronavirus infections. Emerging evidence demonstrates an important direct metabolic and endocrine mechanistic link to the viral disease process. Metabolic syndrome (METS) is a common denominator to these comorbidities and includes insulin resistance, dyslipidaemia, central obesity and hypertension, which are risk factors for the development of type 2 diabetes and cardiovascular diseases. In 2017, it was estimated that METS affected 20% of North American population, 25% of European population and approximately 15% of Chinese population. In this scenario, the relationship between METS and its comorbidities that aggravate the COVID-19 prognosis cannot be ignored. Also, its presence in different ethnicities and continents places METS as an important risk factor for COVID-19. The authors offer their scientific and epidemiological perspective on this emerging association and urge an international awareness of its devastating consequences among certain populations. This article welcomes debate among scientists, policy makers and wider community leaders. The authors urge clinicians to encourage thorough metabolic control for all patients at risk of COVID-19. (a,b) The Physician welcomes contributions from interested scientists, policy makers and patient representative organisations to continue this discourse.

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Introduction

According to Public Health England those from Black, Asian and Minority Ethnic (BAME) backgrounds are at increased risk of poor outcomes from COVID-19. After accounting for effect of sex, age, deprivation and region Bangladeshi's are twice risk of death compared to white British. Other ethnic groups including Chinese, Indian, Pakistani, other Asian, Caribbean and other black ethnicity had a 10-50% increased mortality risk. However, correcting for "comorbidities" the risk is greatly reduced if not eliminated. (1)

It is a known fact that those from South Asian backgrounds (2 billion of the world's population) have a type 2 diabetes prevalence at least twice as high as Caucasians and develop the condition five to ten years earlier at lower levels of adiposity. (2) Two thirds of type 2 diabetes deaths are due to thrombotic complications and amongst Asian

Indians in India 52% of cardiovascular death occurs prematurely, in those under the age of 70. (3) If these premature fatalities trends from heart attack and stroke continue it's estimated that it will cost the Indian economy \$2 trillion by 2030.

Why the greater risk amongst BAME?

Obesity and conditions of the metabolic syndrome are associated with impaired innate and adaptive immunity. Underlying chronic inflammation also linked to excess body fat appears to potentiate risk of the cytokine storm of the Acute Respiratory Distress syndrome. (4)

Optimal metabolic health is having all five, and the metabolic syndrome (METS) is defined as failing to achieve at least three of the following:

- **Blood Pressure (systolic <120 and diastolic <80mmHg)**
- **HbA_{1c} < 5.7%**
- **Waist Circumference <102cm for a man <88cm for a woman (for south Asians it's <90cm for a man and <85cm for a woman)**
- **Blood Triglycerides <1.7mmol/l (< 150mg/dL)**
- **HDL-C >1mmol/l (>40/50mg/dL for men/women)**

Disturbingly only 1 in 8 American adults are now considered to have optimal metabolic health (5) Although there are age disparities, the young are also adversely affected with 1 in 4 aged between 20 and 40 having optimum parameters. On a biological level chronic hyperinsulinemia and/or insulin resistance is strongly associated in the pathogenesis and likely causal. (6)

But just as racism is endemic in the UK National Health Service (NHS) racial bias exists in the identification and management of patients from BAME backgrounds at high risk. Using Body Mass Index (BMI) as a proxy for "healthy weight" may provide the illusion of protection and will miss a substantial proportion of those from black and south Asian ethnic minority groups with METS risk. This is due to an inherent propensity for METS even at lower levels of intra-abdominal adiposity. For example, data from the United States reveals 43.6% of normal BMI south Asians are metabolically unhealthy, compared to 38.5% in Hispanics, 32.2% in Chinese Americans, 31.1% in African Americans, and 21% in whites. Normal BMI metabolically unhealthy have a threefold increased all-cause mortality and or cardiovascular event risk compared to metabolically healthy normal weight over a ten-year period. (7)

Unfortunately, the current NHS risk assessment tool doesn't directly measure metabolic health which is a more sensitive method to identify and subsequently manage BAME individuals at high risk.

Identifying and managing the causes of the causes

Eighty percent of chronic metabolic disease is rooted in lifestyle and environment. Medical literature data is not well publicised on the dietary and lifestyle behaviours of those from BAME backgrounds but what is available paints a concerning picture. In essence an inherent susceptibility to METS is then exacerbated by poor lifestyle behaviours.

Poor Diet

A 2007 study in JAMA revealed low intake of whole fruit and vegetables, as a risk factor for early myocardial

infarction, was very common amongst South Asians, living in the US even amongst vegetarians. (8) Furthermore, the average Indian is consuming more than double the ideal maximum limit of sugar recommended as daily intake from the World Health Organisation. (9) A diet high in refined carbohydrates and ultra-processed foods is likely to be a causative factor in driving metabolic syndrome in South Asians.

Inadequate physical activity

A cross sectional study revealed that South Asians may require 233 minutes a week of moderate activity a week to have the same cardiometabolic benefits of white Europeans carrying out 150 minutes. South Asians, in part due to lower muscle mass, may have a genetic predisposition to lower cardiorespiratory fitness than Caucasians. (10) Amongst all BAME groups in the UK average levels of physical activity are also considerably lower than white British. The latest data from sport England reveals 62% of adults in England meet the Chief Medical Officer's physical activity guidelines compared to just 56% of Black people and 55.1% of Asians.

Low Vitamin D status

Vitamin D plays an essential role in innate and adaptive immunity. Severe Vitamin D deficiency which has been strongly correlated with adverse outcomes from COVID-19 also has a high prevalence amongst BAME groups in the UK. The majority of those from South Asian or Black backgrounds are either deficient or severely deficient. (11)

It's imperative that those from BAME backgrounds know their Vitamin D status but it's not currently routinely measured in primary care. In those who are deficient measures should be taken to correct it. More sun exposure is required to generate adequate levels compared to those of lighter skin colour. If it is not possible to obtain adequate levels through increased sun exposure or through diet then supplementation should be offered. The most important food sources of Vitamin D are fatty fish, cod liver oil, eggs and mushrooms.

Health inequalities require a broader approach

Numerous dietary intervention studies reveal rapid benefits in improving metabolic risk factors. (12) It is plausible that this would also simultaneously reduce risk of severity of COVID-19 complications. For example, better glucose control on hospital admission in type 2 diabetes patients has revealed a ten-fold difference in COVID-19

mortality risk between those with the worst control. (13) A recent small randomised trial revealed reversal of METS in over half of participants within 28 days of a dietary changes in obese adults. This was independent of weight loss. (14) More research and publicity on diet and lifestyle interventions in metabolically unhealthy BAME groups including those with a normal BMI who are at highest risk is also urgently required.

We also cannot ignore the bigger picture issue. All the biological risk factors (as well as increased psychological stress) in ethnic minority groups will be fueled by socio-economic factors. The disproportionate impact of COVID-19 on BAME communities has also highlighted racial and social injustices. The power of modern medicine is dwarfed by the power of prevention and the wider determinants of health. In our view the medical profession and policy makers have an ethical and moral duty to be advocates for policy change to reduce health inequalities. (15) This would have a far greater impact on population health than downstream individually tailored behaviour change. As pioneering German Physician Rudolf Virchow said “for medicine to fulfil her greatest task she must also enter the political and social life”. But the evidence is clear, time for action on metabolic health is long overdue. Otherwise there will be even more misery and devastation when the next pandemic comes round.

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PEER REVIEW COMMENTS

1. The editorial describes potential causes for poor outcomes in BAME population in the setting of COVID 19 infection.
2. The article postulates the need for more sensitive risk factor identification strategy and argues in favour of utilising metabolic syndrome as a tool for risk stratification in BAME population.
3. Grammatical errors and structure sentences needs revision.
4. The last part of the article seems to have been cut off when downloaded
5. Revise with correction of grammatical errors and structure of sentences.
6. Add references to substantiate arguments and resubmit.

The topic is relevant and the hypothesis plausible, but no data linking the two observations and thus a plausible connection is missing. Therefore some evidence on correlation on the epidemiology front would be useful, otherwise this would be a hypothesis not a scientific conclusion.

Resubmit with recommended changes