

Debate: This house believes that UK primary care should be an early adopter of genomic medicine

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Introduction

Genomics is the study of all the DNA in the genome, together with technologies that allow it to be read, analysed and interpreted. Powerful new genomic technologies now allow greater accessibility to the human genome which is, in turn, allowing the integration of genomic data into all aspects of healthcare: increasingly genomic data are being used for the diagnosis and treatment of disease, and in due course are likely to be used for the prevention of disease.¹ At the 2017 RCGP Annual Conference, the topic of whether UK primary healthcare should be an early adopter of genomic medicine was the subject of a debate led by the RCGP committee on medical ethics (CoME). By publishing this paper, we hope that readers who were unable to attend the conference debate will have an opportunity to consider the arguments and take the discussion further, whether in correspondence or on social media.

THAT UK PRIMARY CARE SHOULD BE AN EARLY ADOPTER OF GENOMIC MEDICINE

Genomic medicine is already with us in the NHS. The setting up of the so-called 100,000 genome project, has led to regional genomic medicine centres with laboratory and clinical expertise, and multidisciplinary teams which will help in determining the clinical utility of gene variants. We already have genomic databases which aim to link genotype with phenotype. With costs of sequencing dropping significantly it now means that any one of us can request our genomic information by paying for an over the counter genetic test which provides information around long term conditions such as asthma or hypertension as well as information about personal traits. Let us not forget the affected patient, family, or indeed consumer, should that be a different thing! There is a duty to respond to their needs for self-knowledge, targeted treatments and avoidance of potentially harmful treatments that are unlikely to work. All of these may come from genomic data.

Arguably a curriculum for GPs and other primary care clinicians must relate to whatever patients present with. Thus we have to understand the opportunities and limitations of patients turning up with genomic information to discuss. No doubt the average GP will have learning needs perhaps even 'Patient Unmet Needs' (PUNS) as a result of exposure to genomic conversations with patients. So it is an example of the clinician's duty to practice well and learn to practice well in an always evolving clinical context. Genomics may currently promise more than it delivers, and we must not forget major determinants of health as things are now— social equity, substance misuse, housing etc. However, it is dangerous to ignore the potential for individual benefits of new medical approaches. Genetic illnesses – when monogenic, can be severe and life limiting, such as Huntington's Disease. Polygenic conditions such as ischaemic heart disease are similar. In the polygenic field – the realm of genomics- lie the greatest advances for patient benefit.

There are many reasons to justify the care offered by the GP for the patient: relief of suffering, duty of care, and beneficence. By definition, the genomic patient has acquired a disorder through no fault of their own but by reason of being born. Thus the early use of genomic medicine tackles the inequality of opportunity that is 'bred in the bone'.

In the debate thereafter, points made for the motion included: that all available technologies that could be deployed to patient benefit ought to be so (ethics should not be synonymous with hindrance), and that not being an early adopter meant not being in control of the emerging technology and perhaps even paying more for it as a result.

THAT UK PRIMARY CARE SHOULD NOT BE AN EARLY ADOPTER OF GENOMIC MEDICINE

UK primary care should not be an early adopter of genomic medicine, but neither should it necessarily be a late adopter. Genomic medicine has made important advances with great potential for human good. However, the evidence base is incomplete, the technology still promissory and the underpinning ethical assumptions insufficiently scrutinised.² We do not argue for or against genomic medicine *per se*, but raise concerns about its premature adoption.

Genomic medicine is one term used to describe a supposed new paradigm for health care, building on the Human Genome Project, by using molecular profiling to identify multifactorial health risks and to develop pharmacogenomic drugs, rather than the supposedly dominant ‘one size fits all’ model in prescribing. Emphasis on individuality is evident in the widespread use of the name *personalised* medicine. More recently, perhaps because they appear more scientific, the terms ‘*stratified*’ and ‘*precision*’ medicine have come into favour,³ but lack the powerful appeal of ‘personalised’ medicine, with its promises of greater individual choice and patient empowerment.⁴

Even if the science behind personalised or genomic medicine were really as far advanced as its proponents claim, that would not satisfy ethical qualms about whether it is right or feasible to make decisions made largely on the basis of a patient’s genetic profile.⁵ The decision to offer or withdraw

treatment based on the probability (not certainty) that it will work has little to do with respect for autonomy.

It is frequently argued that genomic personalised medicine will be both more efficient and more cost-effective, because resources will not be wasted on patients whose genotype makes them unlikely to respond to a genomically-targeted drug. But this ignores the serious ethical question of whether or not it is fair to deny treatment to those patients if they request or require it (some chance of benefit being better than none). Genomic information may be the basis of withholding medications that are commonly prescribed on the basis of cost-effectiveness or any other reason.

There is a concern that genomic data will lead to genetic discrimination. In the UK at least, General Practitioners have a role as stewards of patient data. For example, GPs are often asked for medical reports to help decide insurance premiums. The UK insurance industry has a self-imposed moratorium, recently extended until 2019, that states they will not ask policy-holders to have a genetic test, or for the results of a genetic test, for policies valued at less than £500k for life-insurance purposes (and less than £300k for other purposes). Even above these limits, only tests specially approved can be used. However, family history of disease continues to be used to load or refuse premiums.⁶ We wonder whether such a moratorium would be maintained were genomic information to be as much everyday general practice as a 'family history.'

Target populations for pharmacogenomic drugs will necessarily be smaller than the population as a whole.⁷ Indeed, this is a major strength in the eyes of leading advocates of personalised medicine⁸ However, drugs that target a narrower segment of the patient population are often more expensive: one such drug for cystic fibrosis, for example, costs \$300,000 a year.⁹

It is not just a matter of money, but of the ethos of medicine. In other areas of medicine, such as palliative care, clinicians rightfully prioritise patients whose prognosis is poor but whose need is great. It is up to general practitioners to

reflect and decide how they feel about these and similar ethical issues raised by genomic medicine but not so far examined sufficiently. For these reasons, UK primary should not be an early adopter of genomic medicine.

Points made against the motion included the notion that clinicians in primary healthcare already had more tools and indeed problematic issues than they knew what to do with. There was a note of caution about the commissioning of promising but costly technologies before their benefit is proven, especially if this would mean having to decommission something else. Function creep, where technology purchased for a good purpose is used for less laudable aims was also cited.

Discussion

The RCGP annual conference has for many years offered a forum for the discussion of unsettled questions such as the debate discussed here.¹⁰ We have deliberately omitted the result of the debate so as not to bias the reader. Points in favour tended to focus on the technology already being available and that engagement with it would shape it as a force for good. The potential to reduce suffering and maximise resources are features of this good. Points in opposition highlighted potential misuse of the technology, but also highlighted the ideas that it was still promising rather than delivering, and that it times of financial austerity represented an unaffordable luxury.

The unquestionable necessity of exploring the ethical aspects of genomic medicine was very evident.

The debate also highlighted a need for better understanding of genomic medicine, especially in light of genomic testing being available as a direct to consumer service. The Health Education England Resources¹¹ were highlighted as was a paper on the ethical issues inherent in genetics and genomics for GP-trainees. Issues and resources identified in the debate informed a subsequent CoME briefing paper for the RCGP Council. The authors welcome further discussion, especially on Twitter using the #RCGPAC or in direct responses to the BJGP blog.

Acknowledgements

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³ Precision Medicine Initiative (PMI) Working Group (2015) Report to the Advisory Committee to the Director, NIH, The Precision Medicine Initiative Cohort Program—Building a Research Foundation for 21st Century Medicine; Sabatello M, Appelbaum PS (2017) The precision medicine nation. *Hastings Center Report* **47**(4): 19-29.

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¹¹ 11 Genomics Education Programme. Health Education England.
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