

## Precision medicine in colorectal cancer

Precision medicine which has synonyms like “personalized medicine” and “customized therapy” is the buzzword in clinics all around the world. Any form of healthcare that is tailored around the patient profile can be classified as “precision medicine.” Managing a patient based on its unique molecular, physiological and clinicopathological features is replacing “one size fits all” approach.<sup>[1-3]</sup> However, in most cases, the overlap between the two strategies is huge. Healthcare management is attempting to connect all disease types with precision medicine, but the most notable effect is seen in cancer. Among cancer types, solid tumors with interpatient heterogeneity are most likely to witness a paradigm shift in the management plan using precision medicine. Colorectal cancer (CRC) being very heterogeneous could be a model disease to fully implement the concept of precision medicine. This will allow the medical community to assess the economic and social impact of using precision medicine. The magnitude of the disease in Saudi Arabia and other parts of the world would ensure assessment in a conspicuous manner.<sup>[4]</sup> Saudi Arabia is one of the 10 countries in the world having colorectal as most common type of cancer.<sup>[5-7]</sup> This positions the Kingdom to be unique in leading the efforts toward mitigating the losses due to CRC.

The concept of precision medicine itself is very obvious, appealing and promising, but the tools to implement it are still not well worked out. Most of the evidence on which precision medicine is purported to be practiced comes from molecular data. Molecular data in the form of mutations, gene expression changes, change in metabolite and recently immunoscore and so on, are being used to define a patient or a group of patients. This group of patients (or individual patient) is then matched to the best therapy options. With increasing level of precision and accuracy in detecting these molecular alterations in patients or a group of patients, the success of precision medicine is on the rise. The following are key considerations that should be taken into account before implementing the concept of precision medicine in a healthcare setting:

1. Measureable benefits to the patient
2. Cost-efficacy in delivering precision medicine
3. Savings due to removal of unnecessary interventions
4. Ability to implement it at population level.

While precision medicine is widely perceived as a therapeutic strategy, it could be even more effective with

the prevention strategies. A prevention strategy that is based on molecular profile, environment and lifestyle of a group of people could work better than general prevention strategies. Biomarker-based prevention strategies could be highly useful in implementing this strategy. Precision medicine along with suggested screening policy could be an inflection point in the curve of rising CRC incidence in the Kingdom.<sup>[8]</sup> Recent data suggests wide acceptance of CRC screening by the local population.<sup>[9]</sup>

Although it is an exciting time for precision medicine, it needs to be carefully monitored to ensure its success. There are still challenges and hurdles which could derail the efforts. One of the biggest factors is to develop reliable and verifiable tools that can be used in the clinic. This necessitates a flexible model where different patient characteristics can be integrated in a dynamic way to propose targets for personalized intervention. Next would be the cost of practicing precision medicine. Will it make economic sense to provide customized therapy for individuals? Time will tell us whether this paradigm shift in healthcare is ephemeral or long-lasting.

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There are no conflicts of interest.

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### REFERENCES

1. Aziz MA, Yousef Z, Saleh AM, Mohammad S, Al Knawy B. Towards personalized medicine of colorectal cancer. *Crit Rev Oncol Hematol* 2017;118:70-8.
2. Burke W, Psaty BM. Personalized medicine in the era of genomics. *JAMA* 2007;298:1682-4.
3. Henderson D, Ogilvie LA, Hoyle N, Keilholz U, Lange B, Lehrach H.

- OncoTrack Consortium. Personalized medicine approaches for colon cancer driven by genomics and systems biology: OncoTrack. *Biotechnol J* 2014;9:1104-14.
4. Zubaidi AM, AlSubaie NM, AlHumaid AA, Shaik SA, AlKhayal KA, AlObeed OA. Public awareness of colorectal cancer in Saudi Arabia: A survey of 1070 participants in Riyadh. *Saudi J Gastroenterol* 2015;21:78-83.
  5. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018;68:394-424.
  6. Alsanea N, Abduljabbar AS, Alhomoud S, Ashari LH, Hibbert D, Bazarbashi S. Colorectal cancer in Saudi Arabia: Incidence, survival, demographics and implications for national policies. *Ann Saudi Med* 2015;35:196-202.
  7. Aziz MA, Allah-Bakhsh H. Colorectal cancer: A looming threat, opportunities, and challenges for the Saudi population and its healthcare system. *Saudi J Gastroenterol* 2018;24:196-7.
  8. Aljumah AA, Aljebreen AM. Policy of screening for colorectal cancer in Saudi Arabia: A prospective analysis. *Saudi J Gastroenterol* 2017;23:161-8.
  9. Almadi MA, Alghamdi F. The gap between knowledge and undergoing

colorectal cancer screening using the Health Belief Model: A national survey. *Saudi J Gastroenterol* 2019;25:27-39.

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