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Review Article

Advancing Equity in Oncology: Innovative Approaches and Robust Frameworks to Address Cancer Health Disparities

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The 2023 Summit on Cancer Health Disparities took place from April 28 through April 30, 2023. This manuscript summarizes three pivotal talks that underscored significant discussions on cancer inequities. Dr. Hiba Khan's session, "Rising Tide of Biomarker Selected Studies – How Genomic Testing is Key to Unlocking Inequities in Oncology Clinical Trial Access," delved into the vital role genomic testing plays in eliminating disparities within oncology clinical trials. The next session by Dr. Curtiland Deville, titled "Advanced Imaging and Stage Migration – How Findings More Diseases May Lead to More Opportunities," explored how advanced imaging and disease stage migration can unearth further opportunities for equitable treatment access. Lastly, Dr. Samuel Washington's presentation, "Applying a Social Determinant of Health Framework to Address Clinical Trial Inequities," offered a thorough exploration into the use of social determinants of health as a strategy to rectify clinical trial inequities. Under the guidance of the session's chair, Dr. Hala Borno, these presentations foster a nuanced understanding of cancer disparities, emphasizing the importance of innovative approaches and robust frameworks to bridge the gap in cancer care and research. This summary is an essential reference point for practitioners, policymakers, and stakeholders invested in overcoming the profound challenge of cancer disparities.

Take Home Message

- The use of genomic testing and biomarkers significantly impacts the access and outcomes of oncology clinical trials, as demonstrated by Dr. Hiba Khan. However, disparities currently exist in this area, and barriers such as insurance coverage, education gaps, and patient distrust must be addressed to increase testing rates and improve cancer care for underrepresented populations.
- Advanced imaging technologies, as discussed by Dr. Curtiland Deville, are revolutionizing prostate cancer detection and treatment. However, it's essential to recognize the potential for these technologies to exacerbate health disparities due to race, socioeconomic status, and age. Further efforts should prioritize ensuring equitable access across all patient groups to maximize the benefits of these advancements.
- As emphasized by Dr. Samuel Washington, applying a social determinant of health framework is crucial to address clinical trial inequities. This approach requires moving beyond traditional research institutions and engaging with community partners to understand and address the social and environmental risks contributing to health disparities. It underscores the importance of understanding and addressing the local barriers to participation in clinical trials.

RISING TIDE OF BIOMARKER SELECTED STUDIES – HOW GENOMIC TESTING IS KEY TO UNLOCKING INEQUITIES IN ONCOLOGY CLINICAL TRIAL ACCESS

OVERVIEW

Dr. Hiba Khan led off her presentation by describing what biomarkers are and how they are used to guide targeted therapeutic approaches, predict the risk of recurrence or progression, and monitor for residual disease. She outlined how biomarkers are essential in applying precision medicine for disease prevention, diagnosis, and treatment while noting several studies have shown how biomarker testing inequities impact the ability of patients to enroll on clinical trials. Next, she reviewed a study that demonstrated how patients with stage IV lung cancer with a higher socioeconomic status received more genomic testing and how genomic testing was associated with improved overall survival in this patient population.[1] Dr. Khan reviewed another study which showed that patients with non-small cell lung cancer and colorectal cancer who had biomarker testing performed were more likely to enroll in clinical trials than patients who did not have biomarker testing.[2] The final study she reviewed was an analysis of patients enrolled in clinical trials that showed how American Indian and Alaska Native, Black, and Hispanic patients were underrepresented in clinical trials after adjusting for various demographic factors.[3]

The importance of biomarker testing was further emphasized as Dr. Khan spoke about how cancer-related mortality rates among underrepresented minorities are higher, the incidence of targetable biomarkers differs by race and ethnicity, and biomarker testing rates are lower in patients who are not White as well as those with Medicaid and those residing in lower poverty tracts.[4-10] A Venn diagram showed how systems (payer coverage, standardization, workforce shortages), providers (guideline adherence, education gaps), and patients (distrust, time, social determinants of health) all play a role and are influenced by biomarker testing.[11-13] She emphasized improving access to biomarker testing and highlighted the ongoing GENTLeMEN and GIFTS studies created to enhance the feasibility of obtaining germline genetic testing and counseling.[14, 15] Lastly, Dr. Khan stressed the importance of establishing community partnerships, addressing the social determinants of health, and engaging patient navigators to increase rates of biomarker testing.

KEY LEARNINGS

- Precision oncology can lead to improved outcomes, but inequities in access exist.
- Biomarker testing is essential to widening precision oncology clinical trial access.

ACTIONABLE INSIGHTS

- Identifying barriers to biomarker testing is key to designing interventions that move the needle toward equity.

ADVANCED IMAGING AND STAGE MIGRATION – HOW FINDINGS MORE DISEASES MAY LEAD TO MORE OPPORTUNITIES

OVERVIEW

Dr. Curtiland Deville began his discussion by summarizing how prostate-specific membrane antigen (PSMA) PET-CT has ushered in a new era of detection in the staging of prostate cancer, detecting recurrence and metastatic progression, and monitoring response to radiopharmaceutical treatment. He discussed a trial of 307 patients with high-risk prostate cancer who underwent either PSMA PET-CT or conventional imaging that showed PSMA PET-CT had higher accuracy for staging nodal or distant metastatic disease while conventional imaging had more equivocal findings.[16] Dr. Deville then spoke about a trial that included 208 patients with biochemically recurrent prostate cancer who underwent imaging with ^{17}F-DCFPyL that showed this imaging modality had a high disease detection rate and that using this imaging modality led to many patients having a change in management.[18] A subsequent study showed that

including the radiotracer ^{17}F-fluciclovine (Axumin), compared to conventional imaging, into salvage radiotherapy decision-making and planning improved three-year event-free survival.[17] These studies culminated in the formulation of an ongoing trial that aims to identify the ideal strategy to treat patients who experience biochemical recurrence post-prostatectomy, named INDICATE (NCT04423211).

Dr. Deville then spoke about how the terms oligoprogression and oligometastatic disease are thought of in prostate cancer and how improving technologies to detect disease has led many to think of prostate cancer on a spectrum rather than solely localized versus metastatic disease. This led to a discussion of a trial of fifty-four patients with recurrent hormone-sensitive prostate cancer with one to three metastatic lesions that were less than or equal to five centimeters who underwent stereotactic ablative radiotherapy, which led to improvements in progression-free survival compared to patients who underwent observation.[19] Dr. Deville posed the question as to whether radiopharmaceutical therapies, in conjunction with imaging techniques, could lead to better outcomes in patients with castrate sensitive disease and pointed to two trials evaluating this subject.[20,21]

Then, Dr. Deville pivoted to tie in the aforementioned imaging techniques and how they could potentially exacerbate health disparities, as seen in a SEER analysis that showed Black male patients had higher odds of overuse of pelvic CT and bone scans, patients with higher income and younger age were more likely to receive imaging adherent to NCCN guidelines, and patients who were Black and Hispanic are less likely than White patients to receive prostate multiparametric MRI.[22] Further, Dr. Deville touched on published data that suggested sociodemographic factors and manifestations of structural racism, including poverty and residential segregation, explained most of the racial disparity in the use of prostate MRI among Black versus White patients.[23] Similarly, at a single US tertiary medical center, access to ^{68}Ga-PSMA-11 for Black patients with prostate cancer was utilized nearly four times less than for White patients.[24] Next, Dr. Deville remarked on a review of twenty-two studies that showed variation in the type of therapies administered by insurance status, age, race/ethnicity, and location of residence (rural versus urban).[25] Lastly, Dr. Deville mentioned how Black patients with prostate cancer had been found to be less likely to receive shorter, accelerated (hypofractionated) radiation for prostate cancer and breast cancer despite evidence suggesting that shorter regimens may lower rates of noncompliance with similar oncologic outcomes.[26,27]

KEY LEARNINGS

- Advanced molecular imaging has ushered in an improved era of diagnostic accuracy in prostate cancer.
- Radiopharmaceuticals are being deployed based on advanced molecular imaging in prostate cancer.
- Clinical outcomes after radiation therapy have improved based on prospective high-level evidence.
- Health disparities and inequities exist in the use of diagnostic imaging and radiation therapy for patients with prostate cancer.

ACTIONABLE INSIGHTS

- Future research will investigate how image-based risk stratification can better guide treatment and intensification strategies.
- Intentional efforts are needed to ensure that health inequities are not exacerbated by implementation gaps and provider bias in ordering advanced imaging technologies.

APPLYING A SOCIAL DETERMINANT OF HEALTH FRAMEWORK TO ADDRESS CLINICAL TRIAL INEQUITIES

OVERVIEW

Dr. Washington opened by defining healthcare disparities as differences between populations and groups and emphasized the importance of context in understanding how and why disparities exist. He reviewed the definitions of the term "social determinants of health" (SDoH) as made by the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO). The CDC adopted their definition of SDoH from the WHO, who define SDoH as the "conditions in which people are born, live, and age, and the wider set of forces and systems shaping the conditions of daily life".[28] Dr. Washington reviewed the primary domains of the social determinants of health as outlined by the CDC's Healthy People 2020 initiative: education access and quality, health care access and quality, neighborhood and built environment, social and community context, and economic stability. Next, he examined the discordance between the proportion of Black and Hispanic individuals living in the United States and the much lower proportion of Black and Hispanic patients enrolled in clinical trials.[29] He spent time differentiating SDoH from social risk and unmet social needs and explained how this distinction is vital in determining what is attributable to the environment, institutions, and structural racism. Finally, Dr. Washington illustrated how community-engaged approaches to advancing health equity improve patient outcomes. He clarified that healthcare providers and institutions must look into their own backyard to understand social risk factors before moving towards intervention.

KEY LEARNINGS

- More input from outside institutions and clinicians' comfort zones is needed to guide research and improve cancer treatment and outcomes.
- The answers needed to push forward will come from partnerships outside the typical institutions and organizations.
- Community engagement requires interacting with the community to understand the community's priorities.

ACTIONABLE INSIGHTS

- Develop strategic partnerships with community and local groups to understand local barriers to participation.
- Understand and assess SDOH-related issues that are most prevalent/impactful in the patient population.
- Identify local, institutional, and system-level resources to address and mitigate barriers.

CONFLICT OF INTEREST

None

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i. All authors: conception and design
ii. All authors: data collection and assembly
iii. ML: data analysis, manuscript writing
All authors have approved the manuscript

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REFERENCES

1. Kehl KL, Lathan CS, Johnson BE, Schrag D. Race, poverty, and initial implementation of precision medicine for lung cancer. *J Natl Cancer Inst*. 2019;111(4):431-434. doi:10.1093/jnci/djy202

2. Bruno DS, Hess LM, Li X, Su EW, Patel M. Disparities in Biomarker Testing and Clinical Trial Enrollment Among Patients With Lung, Breast, or Colorectal Cancers in the United States. *JCO Precis Oncol*. 2022;(6). doi:10.1200/po.21.00427

3. Aldrighetti CM, Niemierko A, Van Allen EM, Willers H, Kamran SC. Racial and ethnic disparities among participants in precision oncology clinical studies. *J Clin Oncol*. 2021;39(15_suppl):3014-3014. doi:10.1200/jco.2021.39.15_suppl.3014

4. Carrot-Zhang J, Soca-Chafre G, Patterson N, et al. Genetic ancestry contributes to somatic mutations in lung cancers from admixed latin american populations. *Cancer Discov*. 2021;11(3):591-598. doi:10.1158/2159-8290.cd-20-1165

5. Giri VN, Hartman R, Pritzlaff M, Horton C, Keith SW. Germline Variant Spectrum Among African American Men Undergoing Prostate Cancer Germline Testing: Need for Equity in Genetic Testing. *JCO Precis Oncol*. 2022;(6). doi:10.1200/po.22.00234

6. Koga Y, Song H, Chalmers ZR, et al. Genomic profiling of prostate cancers from men with African and European ancestry. *Clinical Cancer Research*. 2020;26(17):4651-4660. doi:10.1158/1078-0432.ccr-19-4112

7. Cheung ATM, Palapattu EL, Pompa IR, et al. Racial and ethnic disparities in a real-world precision oncology data registry. *npj Precis Oncol*. 2023;7(1). doi:10.1038/s41698-023-00351-6

8. Sivakumar S, Lee JK, Moore JA, et al. Ancestral characterization of the genomic landscape, comprehensive genomic profiling utilization, and treatment patterns may inform disparities in advanced prostate cancer: A large-scale analysis. *J Clin Oncol*. 2021;39(15_suppl):5003-5003. doi:10.1200/jco.2021.39.15_suppl.5003

9. Illei PB, Wong W, Wu N, et al. ALK Testing Trends and Patterns Among Community Practices in the United States. *JCO Precis Oncol*. 2018;(2):1-11. doi:10.1200/po.18.00159

10. Yoon B, Weeraratne D, Arriaga YE, Huang H, Osterman TJ. Evaluating health disparities in access to genomic testing for metastatic non-small cell lung cancer patients. *J Clin Oncol*. 2021;39(28_suppl):113. doi:10.1200/jco.2020.39.28_suppl.113

11. Rogers CR, Rovito MJ, Hussein M, et al. Attitudes Toward Genomic Testing and Prostate Cancer Research Among Black Men. *Am J Prev Med*. 2018;55(5):S103-S111. doi:10.1016/j.amepre.2018.05.028

12. Suther S, Kiros GE. Barriers to the use of genetic testing: A study of racial and ethnic disparities. *Genetics in Medicine*. 2009;11(9):655-662. doi:10.1097/gim.0b013e3181ab22aa

13. Yeh VM, Bergner EM, Bruce MA, et al. Can precision medicine actually help people like me? African American and Hispanic perspectives on the benefits and barriers of precision medicine. *Ethn Dis*. 2020;30(Suppl 1):149-158. doi:10.18865/ed.30.s1.149

14. Cheng HH, Sokolova AO, Gulati R, et al. Internet-Based Germline Genetic Testing for Men With Metastatic Prostate Cancer. *JCO Precis Oncol*. 2023;(7). doi:10.1200/po.22.00104

15. Khan H, Wong RL, Darst B, et al. Rates of germline genetic testing and DNA damage response mutations found through population-based recruitment of men with incident metastatic prostate cancer. *J Clin Oncol*. 2022;40(16_suppl):10501. doi:10.1200/jco.2022.40.16_suppl.10501

16. Hofman MS, Lawrentschuk N, Francis RJ, et al. Prostate-specific membrane antigen PET-CT in patients with high-risk prostate cancer before curative-intent surgery or radiotherapy (proPSMA): a prospective, randomised, multicentre study. *The Lancet*. 2020;395(10231):1208-1216. doi:10.1016/s0140-6736(20)30314-7

17. Jani AB, Schreibmann E, Goyal S, et al. 18F-fluciclovine-PET/CT imaging versus conventional imaging alone to guide postprostatectomy salvage radiotherapy for prostate cancer (EMPIRE-1): a single centre, open-label, phase 2/3 randomised controlled trial. *The Lancet*. 2021;397(10288):1895-1904. doi:10.1016/s0140-6736(21)00581-x

18. Morris MJ, Rowe SP, Gorin MA, et al. Diagnostic performance of 18F-DCFPyL-PET/CT in men with biochemically recurrent prostate cancer: Results from the CONDOR Phase III, multicenter study. *Clinical Cancer Research*. 2021;27(13):3674-3682. doi:10.1158/1078-0432.ccr-20-4573

19. Phillips R, Shi WY, Deek M, et al. Outcomes of Observation vs Stereotactic Ablative Radiation for Oligometastatic Prostate Cancer: The ORIOLE Phase 2 Randomized Clinical Trial. *JAMA Oncol*. 2020;6(5):650. doi:10.1001/jamaoncol.2020.0147

20. Deek MP, Hasan H, Phillips R, et al. A phase II randomized trial of RAdium-223 dichloride and SABR versus SABR for oligomEtastatic prostate caNcerS (RAVENS). *J Clin Oncol*. 2020;38(15_suppl):TPS5586. doi:10.1200/jco.2020.38.15_suppl.tps5586

21. Ma TM, Czernin J, Felix C, et al. LUNAR: a randomized Phase 2 study of ^{177}Lutetium-PSMA Neoadjuvant to Ablative Radiotherapy for Oligorecurrent Prostate Cancer (clinical trial protocol). *BJU Int*. 2023;132(1):65-74. doi:10.1111/bju.15988

22. Washington C, Deville C Jr. Health disparities and inequities in the utilization of diagnostic imaging for prostate cancer. *Abdom Radiol*. 2020;45(12):4090-4096. doi:10.1007/s00261-020-02657-6

23. Leapman MS, Dinan M, Pasha S, et al. Mediators of Racial Disparity in the Use of Prostate Magnetic Resonance Imaging among Patients with Prostate Cancer. *JAMA Oncol*. 2022;8(5):687. doi:10.1001/jamaoncol.2021.8116

24. Bucknor MD, Lichtensztajn DY, Lin TK, Borno HT, Gomez SL, Hope TA. Disparities in PET Imaging for Prostate Cancer at a Tertiary Academic Medical Center. *J Nucl Med*. 2021;62(5):695-699. doi:10.2967/jnumed.120.251751

25. Gardner U Jr, McClelland S III, Deville C Jr. Disparities in the Utilization of Radiation Therapy for Prostate Cancer in the United States: A Comprehensive Review. *Adv Radiat Oncol*. 2022;7(4):100943. doi:10.1016/j.adro.2022.100943

26. Dee EC, Taunk NK, Chino FL, et al. Shorter Radiation Regimens and Treatment Noncompletion Among Patients With Breast and Prostate Cancer in the United States: An Analysis of Racial Disparities in Access and Quality. *JCO Oncol Pract*. 2023;19(2):e197-e212. doi:10.1200/op.22.00383

27. Alcorn SR, Deville C Jr. Ensuring That Health Inequities and Disparities Are Not Exacerbated in the Evolving Oligometastatic Treatment Paradigm. *Int J Radiat Oncol Biol Phys*. 2022;114(5):843-845. doi:10.1016/j.ijrobp.2022.09.047

28. Hacker K, Auerbach J, Ikeda R, Philip C, Houry D. Social Determinants of Health—An Approach Taken at CDC. *Journal of Public Health Management and Practice*. 2022;28(6):589-594. doi:10.1097/phh.0000000000001626

29. Clark LT, Watkins L, Piña IL, et al. Increasing Diversity in Clinical Trials: Overcoming Critical Barriers. *Curr Probl Cardiol*. 2019;44(5):148-172. doi:10.1016/j.cpcardiol.2018.11.002