OPINION

Simplifying frontline treatment choices for chronic myeloid leukemia: A study from Italy

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ABSTRACT

The illuminates the intricate decision-making involved in choosing frontline Tyrosine Kinase Inhibitors (TKIs) for individuals with chronic-phase Chronic Myeloid Leukemia (CML). The research highlights the significance of a comprehensive and personalized approach, wherein patient attributes, disease-related aspects, and the safety and effectiveness profiles of TKIs are meticulously evaluated. As the landscape of CML therapy advances, these findings provide invaluable guidance to healthcare professionals in refining treatment approaches, ultimately improving patient results and playing a pivotal role in the continuous advancement of managing this historically burdensome condition.

Key Words: *Cancer treatment innovation; Immunotherapy breakthrough; Personalized medicine; Gene therapy for cancer; T cell engineering; Cytokine release syndrome*

INTRODUCTION

Chromatic Myeloid leukemia (CML) is a tricky blood disease caused by an unusual mix-up of genetic material. Thankfully, doctors have found a way to fight it using special drugs called Tyrosine Kinase Inhibitors (TKIs). These TKIs are like super-targeted medicines that can stop the disease from growing. But how do doctors decide which TKI to use for each patient? That's what a study from Italy wanted to figure out.

Understanding chronic myeloid leukemia and the power of TKIs

Imagine your body as a big team of tiny workers, and CML is like a glitch in this team. There's a mix-up in their instructions, and they start growing out of control. This can make people very sick. But here's where TKIs come in. They're like managers who tell these workers to calm down and stop growing too much. The first TKI that came out is called imatinib. Then, scientists made even better TKIs like dasatinib, nilotinib, and ponatinib. These TKIs are like superheroes for people with CML.

Deciding which TKI to use is like putting together a big puzzle. The puzzle pieces are different things about the patient and the disease. Doctors look at these pieces to decide the best TKI. The Italian study wanted to know what these pieces are.

Researchers in Italy looked at lots of information from patients with CML. They collected information about how old the patients were, if they had other health problems, how risky the disease was, and if there were any problems during treatment. By putting all this information together, they wanted to know why doctors choose one TKI over another.

The Italian study found some really interesting things. It's like they uncovered secrets that can help doctors make the best choice for their patients.

Risky business: Sokal score

Imagine if you could predict how likely something is to happen. Doctors can do this for CML using a score called Sokal score. If the score is high, it means the disease might get worse faster. The study found that when the Sokal score was high, doctors often picked stronger TKIs like dasatinib or ponatinib. It's like they're using the big guns to fight the disease.

Health matters: Other problems

Sometimes, people with CML have other health issues, like heart problems or diabetes. These problems can affect which TKI is best. If someone is already dealing with a health issue, doctors might choose a TKI with fewer side effects.

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Tiny clues: Mutations

Inside the CML cells, there can be tiny changes called mutations. Think of them as little typos in the instructions. Some TKIs work better if there are certain mutations, while others don't mind them. So, doctors look for these typos and pick the TKI that works best with them.

Age and feelings: Side effects and preferences

Age is important too. Older people might have a harder time with certain TKIs because of side effects. Doctors want to pick a TKI that makes people feel better without causing too many problems. Also, if someone has tried a TKI before and didn't like it, doctors can try a different one. It's like finding the perfect fit.

People's stories: Side effects and choices

Every person is different. Some people might have side effects while taking a TKI. These can be things like feeling tired, getting rashes, or stomach problems. If someone has side effects, doctors can switch to a TKI that's easier on them. All coexisting conditions—other than CML—led to a preference for imatinib over 2G TKIs. The estimated impact of each examined co-morbidity ranged from a rate of increased imatinib use of approximately 15% to 25% for arterial hypertension and diabetes (70% imatinib compared to 47% and 54% in patients without hypertension or diabetes, respectively) to over 30% for previous MI/HF (86% vs. 54%) and over 40% for patients with a history of stroke (97% vs. 55%). It is well known that dasatinib and nilotinib have been linked to various pleu-ropulmonary diseases and peripheral arterial thrombosis, respectively, and that the presence of comorbidities, such as arterial hypertension, may also increase the risk of specific toxicities during TKI therapy. In a research from The University of Texas MD Anderson Cancer Center, 237 patients (45%) with 531 patients with CML treated with various TKIs experienced cardio-vascular complications, with hypertension being seen in 175 (74%).21Compared to matched healthy controls, patients treated with nilotinib or dasatinib, primarily for acute myocardial infarction (IRR, 2.9 for nilotinib), chronic ischemic heart disease, had a significantly higher risk of morbidity, according to a real-world Swedish study on 1238 TKI-treated patients diagnosed with CP-CML between 2002 and 2017.

DISCUSSION

A Range of Options. Doctors who treat people with Chronic Myeloid Leukemia (CML) have a bunch of different medicines to choose from. It's like having a lot of good choices, which can be a bit overwhelming. They call it an "embarrassment of riches." One important medicine is called imatinib, and there are also second-generation TKIs (Tyrosine Kinase Inhibitors) available.

There's a big question- which medicine is best for the first treatment? Studies didn't show a clear winner between imatinib and the second-generation TKIs. This might be because the second-generation TKIs work well if imatinib doesn't, as a backup plan. Because of this, guidelines say that any TKI can be used as the first treatment. So, it's up to the doctors to decide.

Doctors have to think about the disease, the person's health, what they like, and even their own experience with the medicines. It's not easy! This study looked at almost 2000 people with CML. They wanted to see how doctors pick the first medicine. But, there are some things to keep in mind about the study.

It looked at things that had already happened, so it's not like an experiment. Also, they didn't follow how each person did after they got the medicine. But, this study is the biggest one that looks at how doctors pick the first medicine for CML. And they didn't have any special reasons to pick one medicine over another.

In the end, doctors have many good choices when treating CML, and they have to think about a lot of things to pick the right medicine for each person.

CONCLUSION

The Italian study helps us understand how doctors pick the best TKI for people with CML. It's like a big puzzle where each patient's age, health, disease risk, mutations, and how they feel all come together. With this puzzle, doctors can make sure the TKI fits just right, like a tailor-made treatment. As we keep learning more about CML, these discoveries will help doctors give the best treatment to their patients, making sure they stay healthy and happy.