

THE QUALITY OF WARFARIN THERAPY AMONG ATRIAL FIBRILLATION PATIENTS IN FINLAND - RESULTS FROM THE FINWAF REGISTRY

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RATIONALE

Warfarin is an anticoagulant that has been used to reduce the risk of stroke and thromboembolic events in atrial fibrillation (AF) patients for decades. It has narrow therapeutic index. Hence, continuous monitoring and adjustment of the dose of warfarin are important in order to avoid bleeding and thrombotic complications.

OBJECTIVES

The objective of this study was to investigate the overall quality of warfarin therapy in Finnish AF patients.

METHODS

The FinWAF Registry contains real-life data on patients with AF diagnosis between 1 Jan 2005 and 31 Dec 2009, at least one warfarin purchase, and at least one prothrombin time measurement, expressed as international normalized ratio (INR), between 1 Jan 2007 to 31 Dec 2009.

The quality of warfarin therapy was calculated as time in therapeutic range (TTR) defined as percentage of time with INR 2.0–3.0 during the previous 60 days (Figure 1).

The first 6 months from treatment initiation were excluded from TTR summaries and follow-up time further than 60 days from the latest INR sample excluded from all analyses. Thereafter, the proportion of days and patients with poor TTR ($\leq 40\%$), moderate TTR ($>60\%$) and good TTR ($>80\%$) was summarized. Incidence rates of stroke, overall mortality and adverse bleeding events were determined for different TTR levels.

ACKNOWLEDGEMENTS

This study complied with the European Network of Centers for Pharmacoepidemiology and Pharmacovigilance (ENCePP) Code of Conduct and was registered into the ENCePP e-register (EU PAS register number: EUPAS4700).

The ethical committee of the Hospital District of Helsinki and Uusimaa, Finland accepted the study protocol. The data permits were received from the Social Insurance Institute, the National Institute for Health and Welfare, Population Register Center, and Statistics Finland.

We recognize the following Finnish central laboratories for providing blood count data including the INR-values: HUSLAB, Helsinki; TYKSLAB, Turku; FIMLAB, Tampere and FIMLAB, Central Finland; ISLAB, Kuopio; and NORLAB Oulu.

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REFERENCES

1. Lehto et al. Risk of Stroke, Bleeding and Mortality is Strongly Associated with the Quality of Warfarin Therapy. Results from the FinWAF Registry with 54568 Patients. American Heart Association Congress 2015, oral presentation.

RESULTS

The FinWAF Registry included 54568 AF patients, representing more than half of all anticoagulated AF patients in Finland. During the 5-year study period 2007 – 2011, the average follow-up time per patient was 3.2 years. The average number of INR measurements per patient was 57 (range 1 – 586) with approximately 1.5 INR samples collected monthly. Patients had on average 75% (median 94%) of their follow-up time within 60 days from the latest INR sample.

Figure 1. Illustration of the definition of TTR.

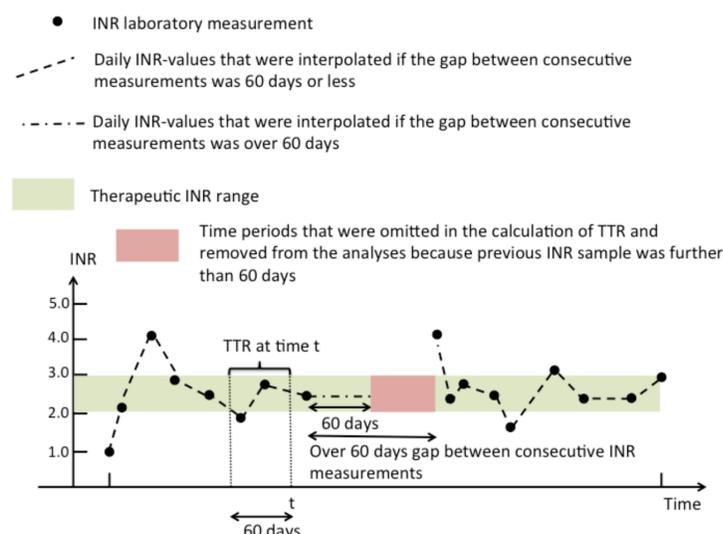


Figure 3. Proportion of patients spending $<50\%$, $51-70\%$ and $>70\%$ of their follow-up time over different TTR levels. Each bar in the figure presents the patient distribution by time spent over the given TTR level.

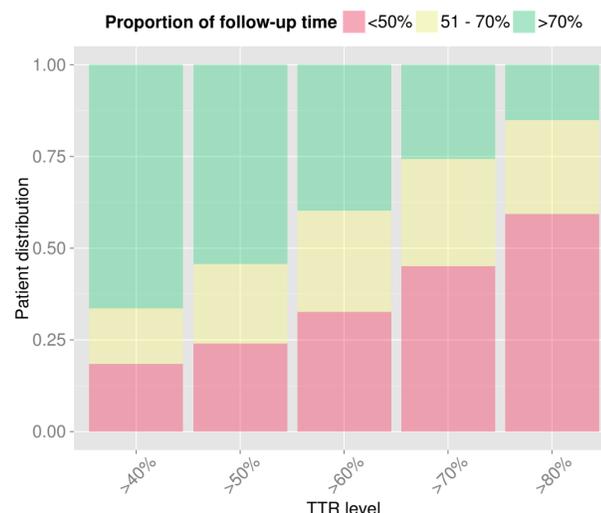
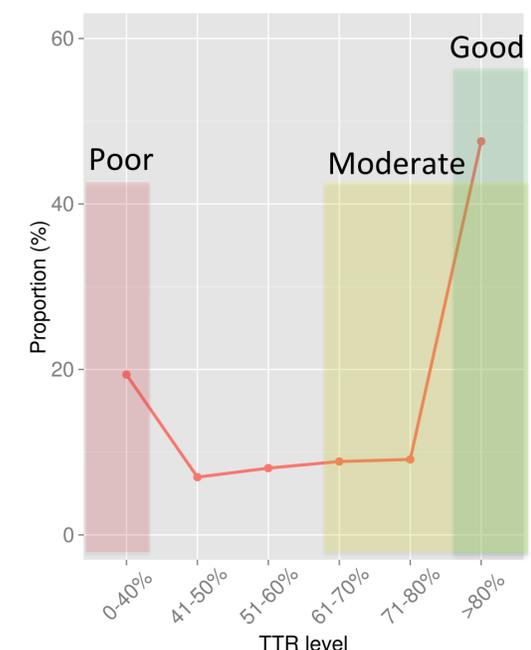


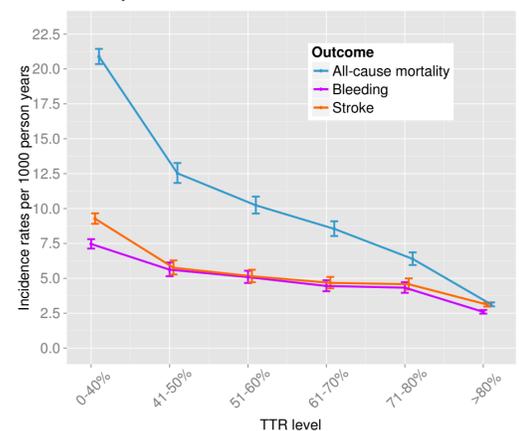
Figure 4. Incidence rates of all-cause mortality, bleeding and stroke as a function of TTR.

As presented in Figure 4 and previously by Lehto et al.¹ incidence rates of all-cause mortality, bleeding and stroke decreased with increasing TTR. The result remained when adjusting for several potential confounders.¹

Figure 2. Distribution of TTR over the total follow-up time accumulated from all patients in the study.



Fifteen percent of patients maintained good TTR for most ($>70\%$) of their follow-up time, as indicated by the green area in the rightmost bar in Figure 3. Forty percent of patients maintained moderate TTR for over 70% of their follow-up time (Figure 3, green area in the middle bar). Twelve percent of patients remained in poor TTR for over 70% of their follow-up time.



CONCLUSIONS

TTR was good for nearly half of the total follow-up time but only few patients were able to maintain this level constantly. In addition, although the proportions of patients with constantly poor and good TTR were similar (12% vs. 15%), poor TTR comprised lower proportion of the total follow-up time (19% vs. 48%). The result that the risk of all-cause mortality, bleeding and stroke was strongly associated with TTR highlights the importance of good quality in warfarin treatment. In the future, treatment could be potentially improved by identifying factors associated with TTR.

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