Interpretation and management of INR results: a case history based survey in 13 countries

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Background: A model for post-analytical quality assessment has been developed by the Norwegian Centre for Quality Improvement of Primary Care Laboratories (NOKLUS). In this model, case histories and a corresponding questionnaire regarding different issues on laboratory testing is distributed to the doctors requesting laboratory tests. The results from these surveys are used to evaluate the participating doctors' knowledge of laboratory tests, and to educate the doctors on issues where knowledge is lacking by personal feedback reports. The current study focused on post-analytical quality assessment of vitamin K antagonist (VKA) monitoring, and was designed according to the model described above. The study was done in cooperation with NOKLUS, EQALM, and EFLM. The aim of the study was to evaluate the knowledge and practice on treatment with vitamin K antagonists (VKAs) and INR monitoring in different countries, and to educate the participating doctors by sending an educational feedback report on how to handle the patients and the INR measurement in the case histories according to existing guidelines.

Methods: An English questionnaire with two different case histories was distributed to project coordinators from 12 European countries and Australia. The project coordinators distributed the questionnaire to the doctors taking care of most of the patients treated with VKAs in their country. *Case history A* focused on a patient with atrial fibrillation and stable VKA treatment (latest INR 2.3). Physicians were asked about frequency of INR measurement, when to change the VKA dose, and the patient's annual risk of ischemic stroke and bleeding. *Case history B* focused on a patient with an unexpected INR of 4.8, asking for the patient's 48-hour bleeding risk, the immediate dose reduction and time until a repeat INR.

Results: Altogether, 3016 physicians responded (response rate 8 – 38%), of which 79% were from primary care and 18% from secondary care. Answers varied substantially within and between countries regardless of level of care and VKA used. Median number of weeks between INR measurements in stable VKA treatment was 4 – 6 weeks. Median threshold INR for increasing or decreasing the VKA dose was 1.9 and 3.1, respectively. Risk of ischemic stroke and bleeding were overestimated 2 – 3 times. In case history B, the median dose reduction the two first days was 75% for GPs and 55% for specialists, irrespective of estimates of bleeding risk; with one week to a repeat INR.

Conclusion: Variation in VKA monitoring is substantial implying clinical consequences. Guidelines seem either unknown or may be considered impracticable. Further efforts towards standardisation of VKA management are needed.