We find that a disease such as acute myocardial infarction (MI) is diagnosed from the highly informative test result, acute ST elevation EKG changes with likelihood ratio (LR) OF 13 (1), in a patient in whom it is suspected, with the same high degree of confidence in the high accuracy of this diagnosis all over the world be it in United States (2) or in Europe (2) or in India (3) or in Africa (4). This uniformity in diagnosis is unexpected from a Bayesian standpoint, as prevalence of acute MI, which influences Bayesian diagnosis of this disease (5), varies among these different regions. We shall provide an explanation for this uniformity in this paper.

It is well-known from experience that we suspect acute MI over a period of time in a series of patients with varying presentations and therefore with varying prior probabilities. For example, we suspect it in a 65 year old man with highly characteristic chest pain (high prior probability) as well as in a 40 year old woman with highly uncharacteristic chest pain (low prior probability)(6). We note that we do not know about the prior probability of acute MI in the next patient in whom we suspect it and the prior probability in one patient is independent of prior probability in another patient in whom we suspect it. Therefore, prior probability can be looked upon, we propose, as being a random variable (7) and this series as being a random series. We find that any series of patients with varying prior probabilities in whom acute MI is suspected anywhere in the world will be a random series. All these different random series can be looked upon, we suggest, as random samples drawn from a population of patients with varying prior probabilities in whom acute MI is suspected.

It is customary in practice to perform an EKG in every patient in whom acute MI is suspected. In one random series of patients with varying prior probabilities in whom acute MI is suspected, the frequency of acute MI in presence of acute ST elevation EKG changes has been observed to be 86+/-2 percent with confidence level of 95 percent (8). This means that the sampling distribution of this frequency will be between 84 and 88 percent in 95 percent of all other random samples by the Central Limit Theorem (9). This indicates that if we observe acute ST elevation EKG changes in a patient in whom we suspect acute MI, we are 95 percent confident this patient has been drawn from a random sample in which the

frequency of acute MI in presence of acute ST elevation EKG changes is between 84 and 88 percent. This enables us, we suggest, to infer (diagnose) acute MI with a high degree of confidence (95 percent) in the high accuracy (84 to 88 percent) of this diagnosis. The limits, 84 and 88 percent of the confidence interval 84-88 percent function, as Cox points out (10), as a measuring technique in this patient, which is calibrated like other measuring instruments, indirectly by the hypothetical consequences of its repeated use.

We note the prevalence of acute MI is not a factor in diagnosis of acute MI from acute ST elevation EKG changes and thus this diagnosis is not Bayesian. All over the world, acute MI is diagnosed from performance of the highly informative test result, acute ST elevation EKG changes, in a random series of patients with varying prior probabilities in whom we suspect acute MI. This performance is measured by a frequency which lies in a very narrow range due to the Central Limit Theorem, which makes this diagnosis similar everywhere. This method employed for diagnosis, we propose, is the frequentist confidence method (10).

Thus the diagnosis of acute MI from acute ST elevation EKG changes is similar every where because it is made by the confidence and not by the Bayesian method. In fact, we find that any disease which has a test capable of generating a result with LR greater than 10 (12) is diagnosed in a similar manner all over the world. For example, pulmonary embolism is diagnosed from positive chest CT angiogram, LR 20 (13); deep vein thrombosis from positive venous ultrasound study, LR 16 (14) and covid-19 disease from positive covid-19 PCR test, LR 14 (15) in a similar manner all over the world.

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