Biostatistical Evaluation of Paternity

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Introduction

"In my experience of these cases, apart from one other class - namely fish poaching cases - there is no class of case in which there is a greater degree of perjury in the courts. In those cases which are fought at all there is always flat denial on the one side or the other of the facts at issue."

- Lord Merthyr (1)

"There is nothing more shocking than that injustice should be done on the basis of a legal presumption when justice can be done on the basis of fact."(2)

The purpose of this symposium is to present various approaches for evaluating the results of genetic marker testing in cases of disputed parentage when the tested man has not been excluded. Although each of the speakers advocates a slightly different way of calculating his results, all of us are in agreement that the goal of testing is to exclude all non-fathers and to provide information that will help to establish the identity of the true father. The genetic tests now available make it theoretically possible to achieve this goal in almost all cases; however, as scientists we recognize that the information provided by testing is not absolute.

As one looks at the various approaches to biostatistical evaluation of genetic marker tests it is important to keep in

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mind who will use the information and how it will be perceived. In my country (U.S.A) parentage is often decided by a jury after an adversarial proceeding. In each case the individuals asked to determine the meaning of the biostatistical evidence will have little or no experience on which to base their decision. They will also have listened to a series of convincing arguments by each side which will attempt to extoll and discredit the tests and their meaning. In my opinion it is important that each advocate of particular approach to the calculation be mindful of the potential this process has for confusing the users of information which, though obtained differently, has essentially a similar meaning.(3)

A recent case of mine illustrates what can happen when a jury is presented with different experts' opinion on the biostatistical estimate of paternity. My findings indicated that the likelihood of paternity (using a 50% prior probability) was greater than 99%. The defendant then produced a biostatistician as a witness who claimed that in his opinion (method of calculation not known) there was only a 90% chance the man was the father. After hearing all the testimony, the jury decided the alleged father was not the father. When questioned after the trial it was apparent that the two estimates confused the jury, which was reluctant to declare the man the father because he had only been casually involved with the mother.

The confusion that can occur when two experts seem to have different opinions is minimal compared to the misunderstanding

that is generated when conflicting statements from various publications are presented. Recently some papers in the American Journal of Human Genetics [4,5] have raised several questions about the validity of inclusion estimates. It is unfortunate that the rationale on which these conclusions were based is faulty. It is my hope that the discussions in this symposium will address some of the issues raised in these articles. I hope that through the diversity of opinions expressed here we can reexamine several critical questions without undermining the credibility of the methods used by others.

In conclusion, the following statement, made over thirty years ago, is still applicable.

> "[I]n the field of contested paternity... the truth is so often obscured because social pressures create a conspiracy of silence or, worse, induce deliberate falsity.
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> The value of blood tests as a wholesome aid in the quest for truth in the administration of justice in these matters cannot be gainsaid in this day. Their reliability as an indicator of the truth has been fully established."[6]

References

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