

Studies on exclusion of paternity

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The application of the inheritance of blood groups to disputed paternity studies has been an accepted practice throughout the Western world for the past 40 years. In the United States, blood group studies have somewhat less application than in Europe, and particularly Scandinavia; but nevertheless these tests are widely ordered and play an important part in courtroom decisions pertaining to paternity suits. Complaints in bastardy and domestic relations cases comprise the majority of such suits. These tests were ordered by judges and established as common law before specific statutes were enacted to provide for this type of evidence. The first court decision in which the blood grouping data were requested was in 1932.

The first state law making such tests mandatory was in passed by New York State in 1938.¹ The Ohio law, which was enacted in 1942, is typical of these laws. In part it provides that: "Whenever it is relevant to the defense in a bastardy proceeding, the trial court on motion of the defendant shall order that the complainant, her child, and the defendant submit to one or more blood-grouping tests to determine whether, by use of such tests, the defendant can be determined

not to be the father of the child . . .”² The law also states who may do the test, how the evidence will be presented, what is to be done if either of the parties refuse to submit to the tests, and what procedure must be followed if there is dissatisfaction with the expert’s report. It is recognized that blood testing can only exclude paternity and specifies that nonexclusion reports are not admissible as evidence.

Blood group testing has been selected for paternity studies because blood groups are technically easy to determine and are completely reproducible. The inheritance of the blood group antigens is on the basis of one gene inheritance. Further, most of these genes express themselves in both the homozygous and heterozygous states. This makes the system much more efficient than if one dealt with a somatic characteristic in which one allele is dominant over the others at that locus.

According to the laws of inheritance accepted for the various systems of red cell antigens, one may conclude that a red cell antigen cannot appear in the blood of a child unless it is present in the blood of one or both parents. If a mother’s blood lacks an antigen and the baby’s blood can be shown to possess it, the father must be a man whose blood is positive for this antigen. Thus, all men whose red blood cells fail to demonstrate the antigen are excluded as the baby’s father. Men with blood positive for the antigen cannot be excluded, nor can they be proved to be the father. Consequently, such reports are inconclusive and are not admissible as evidence.

An individual who is homozygous for a blood factor, that is, his blood reacts with only one of the typing sera

used to delineate a particular set of alleles, can only pass to his offspring genes for the antigen demonstrated in his blood. Any child who does not have this characteristic is excluded. A corollary to this is that any child who is homozygous must have inherited a gene for this antigen from each of his parents.³

These rules of inheritance are not sex-linked or sex-related and maternity exclusions as well as paternity exclusions are possible. In practice, this occurs infrequently, but it is important to make the point that if the father is known with certainty and the mother’s identity is questioned, we could apply the same techniques and interpretation used in paternity exclusion studies. Obviously, this situation rarely arises.

Practical aspects

We have been performing studies for exclusion of paternity at the Cleveland Clinic since 1957, and in that period have done more than 1,000 such tests. These procedures must be treated somewhat differently than the usual laboratory tests requested of the clinical laboratory. The immunohematologist who does these tests must remember that he is technically an officer of the court while performing this duty, and that the results of his work can have considerable effect on the decision of the court and thus have a profound effect on the lives of many individuals. As an officer of the court, he is obligated to maintain a completely unbiased approach to the work, to its interpretation and to the method of reporting; he must not be influenced by the personalities of the parties to the suit. His fee is usually paid by the defendant, but this does not make it

less of a requirement that all persons involved in the proceedings receive their just due.

Actually, in any paternity study, there are at least six parties who are involved in the action whose rights have to be protected. The reason that these tests are useful is that they can in many instances protect an innocent man who has been accused in a bastardy action. One tries to exclude him as the father of the child, using tests to detect the red blood cell antigens of the man, the mother, and the baby, and thus determine whether or not an individual with the blood type of the accused could possibly be the father of the child in question. It is important that this be done properly, using correct procedures and reagents, so that the rights of the woman, the second person whose rights must be preserved, are not violated. An erroneous blood test can label her an immoral woman and deprive her of the settlement to which she is entitled to compensate her for her maternity expenses and child support. The child also has the right to have his parentage established; to be named a bastard on the basis of carelessness leading to a laboratory error is obviously a serious miscarriage of justice. The court having asked for advice deserves to have the best advice possible. Society itself has a stake in these proceedings because once a man is freed on a bastardy charge, the support of the child often devolves on the taxpayer, a fact that may on occasion influence a jury to return a guilty verdict.

Finally, the analyst owes it to himself to get the right answers, for not only will his professional pride be hurt if he carries out and reports a test improperly but under some situations he

might be liable for a malpractice suit, or at the very least, an embarrassing time in court. The courts and lawyers may not be very sophisticated about the scientific aspects of blood testing or the techniques used, but they often may have an ingrained suspicion of physicians meddling in what they regard as their business and are only too ready to criticize an error or inconsistency.³

Appointments for collecting the blood specimens for a paternity exclusion study are usually made through the Juvenile or Common Pleas Courts, the lawyers, or even by the individuals concerned. These appointments are not routed through the hospital central appointment system but are made directly with the immunohematologist. All of the persons involved in the case are required to come to the office at the same time, chiefly to identify each other and also to ensure that there are not so many incomplete studies, because one of the principals does not have the time or interest to keep his appointment. Lawyers, parents, concerned and curious friends are not prohibited from being present but are definitely discouraged.

The two "adults" are required to identify each other and someone has to identify the baby. Usually this is done by the mother, but in the case of an older child the man may be able to verify the identification. The man is always asked if he recognizes the baby and his answer is made a part of the record. If the mother cannot identify the baby, and some of them are unable to do so, the baby is usually identified by the social worker or the foster mother. This is also noted in the report.

Infrequently, the rule about the

baby being seen at the same time as the adults has to be waived. Sometimes the baby is up for adoption or has been adopted, and the social workers do not want the mother to see the child. There have also been times that the court has requested that the man not be allowed to see the woman. Such circumstances require special precautions and present special problems. They should not be allowed to become standard practice, as departures from established practices create all kinds of complications.

The man, mother, and child are taken into a private room for the interview. At this point, other people are excluded—the exceptions being interpreters, if needed, and police officers if one of the group is in custody. Their names and addresses are taken and compared with the official notification from the court. This is important because many of these individuals may have moved since they appeared in court. The age is asked partly to obtain more information and to be certain that the baby is at least 3 months old. Blood types are requested and recorded so that if there are discrepancies between the present findings and the individual's understanding of his blood type, there will be an opportunity to check results. People frequently think that they know their blood type when in fact they do not, and one had better be prepared to defend one's work if the results disagree with a person's own recollections. Forewarned by such knowledge one can feel more confident on the witness stand.

Specimens are accepted by mail and reported as such. The physician who takes the blood and mails the specimens has to assume responsibility for their identification. Although the

chain of evidence is weak, this provides a service to people who otherwise could not have the test done. So far this has not been challenged in court. The specimens should be sent by certified or registered mail; special delivery is not necessary.

All laboratory tests are performed by at least two laboratory workers. One of these should be the director of the laboratory or the physician who will sign the report and give testimony if necessary. The work is done independently, and the techniques used by the two individuals doing the work may not necessarily be the same and indeed they should not be. Different typing sera are used whenever possible. Once the work is completed, the results are compared, differences if any reconciled, conclusions reached, and the report written. All reports are prepared in quadruplicate. The original is sent to the court and there are copies for both lawyers. The court may distribute the lawyers' copies; otherwise they are sent directly to them. Whenever possible one of the lawyers should not make this distribution, because if he should fail to give the court or the opposing attorney his copy, then it becomes necessary to subpoena the analyst to get the information into the record.

Testimony in court is rarely required, because the report of nonexclusion is not admissible, and cases with reports of exclusions are most commonly settled out of court or the suits are dropped. Schatkin¹ discussed early cases which were decided without regard to exclusions by blood tests. Fortunately, such decisions are rare today and the one incidence of this type in our series was reversed upon appeal.

Results

The tests are conducted using the three best known blood group systems, ABH, MN and Rh,⁴⁻⁷ and the K antigen of the Kell system and the Fy^a antigen of the Duffy system.⁸ These reactions are considered to be understood well enough to give reliable data. The detection of sickle cell hemoglobin has given us several exclusions. However, because this is not a blood group system, these results were not accepted by the courts.⁹ *Table 1* shows the relative usefulness of the various blood group systems based on our material. It becomes apparent that the vast majority of exclusions are determined by one or more of the three older blood groups, and that further testing is primarily an exercise of the analyst's intellectual curiosity. This is particularly true of the Black group, and leads one to speculate that one's efforts might be better spent investigating blood group systems which are

Table 1. Exclusions by blood groups involved; 108 exclusions

Blood group	Population		
	Cau- casian	Black	Un- known
ABH	13	16	0
MN	5	16	1
Rh	11	14	5
K	4	0	0
Fy ^a	5	0	0
ABH, MN	0	1	1
ABH, Rh	0	1	0
MN, Rh	2	1	1
ABH, MN, Rh	0	1	1
MN, Fy ^a	1	0	0
Rh, K or Fy ^a	3	0	0
Rh and sickle hemoglobin	0	1	0
Sickle hemo- globin	0	3	0

Table 2. Exclusion rates by race; data from 776 tests

Race	Exclusions	
	No.	%
Caucasian	360	13.0
Black	385	14.0
Unknown	39	20.5
All cases	784	13.6

more suitable for this race. The systems currently in use have been oriented toward the blood groups found in a Caucasian population.

The expected exclusion rate is approximately 54% using the blood group systems which are commonly accepted as well enough understood to be reliable for this type of work.¹⁰ This value applies to a Caucasian population and assumes that the men involved are innocent of the accusation made by the woman. The overall exclusion rate in our series is about 14%, but of course not all the men in our studies have been innocent. Indeed most of them have had an opportunity to have fathered a child by the complainant, and many of the liaisons have been long-standing affairs. If roughly half the innocent men can be exonerated using blood grouping data, then it is fair to assume that almost a third of men involved in suits involving paternity are innocent of being the father of the child in question. When the cases are broken down by race, one sees that there is little difference in the exclusion rate in the Black and Caucasian group (*Table 2*). One would expect the Blacks to have a lower exclusion rate than Caucasians because they are a more homogeneous race and many of the antigens we test for in Caucasians have little application in

Table 3. Exclusion rates by type of court action; data from 776 tests

	Exclusions	
	No.	%
Illegitimacy	676	10.1
Divorce	72	44.4

the Blacks because they occur so infrequently in that race. The Kell and Duffy antigens, for example, rarely occur in Blacks but are responsible for about 10% of our exclusions in Caucasians. On the other hand, the social mores of the two groups may differ significantly enough to cancel much of the effect of the genetic variations between the two groups. The higher percentage of exclusions in the "unknown" group is an artefact produced by the population group from which those cases were derived; these cases were mostly from a completely different population than the Cuyahoga County cases.

When the cases are divided into those involving divorce and those involving bastardy proceedings, the difference in the exclusion rate is startling, as the exclusion rate for the divorce proceedings approaches the expected rate. (*Table 3*) If one makes the logical assumption that approximately twice the exclusion rate represents the men in the study who are not the fathers of the children in question, then it appears that most women accused of adultery by their husbands as part of a divorce action are actually guilty.

Summary

The acceptance of the application of blood group data to exclusion of paternity studies has developed from the situation 40 years ago when these

data were accepted or rejected as scientific curiosities at the whim of the judge to what is now almost complete acceptance in most legal jurisdictions.¹ Despite this almost universal acceptance and the skyrocketing rise in the illegitimacy rates in Cuyahoga County and nationwide,¹¹ there has not been any significant increase in the number of these tests ordered each year. The new morality, although responsible for a vast increase in extramarital conceptions, removes much of the stigmata of illegitimate birth and lessens the urgency to fix blame for it. This results in a decreasing need for court action, especially when it is apparent that such action will not produce monetary benefit to the mother. Changing of public attitudes and relaxation of social service policies have further contributed to a more casual approach to the problems of the mother, so that she sees less reason to impose a share of the responsibility for her misfortune upon someone else. This is perhaps fortunate because the laboratory personnel and facilities are not available presently to perform blood tests for all of the nearly 4,000 illegitimate births each year in Cuyahoga County.¹¹

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