LETTERS TO THE EDITOR

The objectives of medical research

EDITOR,—Dr Marlow’s interesting annotation on high frequency ventilation,1 with its pithy epigraph, ‘for a common attitude to the methodology of medical research. This holds that, to be “scientific,” a study must specify a null hypothesis and then attempt, using data, to disprove it. This agrees with the writings of Karl Popper, who wrote: “Every experiment may be said to exist only to give the facts a chance of disproving the null hypothesis.”

In recent years many statisticians have come to take a much broader view of research methodology. In applied fields such as medicine, engineering, and agriculture, null hypotheses—that two treatments are equal in their effects—are often neither plausible nor interesting, and it must be remembered that the null hypothesis specifies exact equality, not merely negligible difference. Instead, the existence of a difference between the treatments is taken for granted and the study aims at establishing its size, whether it is large enough to be important, or perhaps small enough to be ignored. The calculation of confidence limits aims precisely at demarcating the range of true differences which are consistent with the data; whether or not these include zero is of secondary importance. I have referred to this type of study as “technological.”

Schwartz et al2 make a similar distinction between explanatory and pragmatic clinical trials. They point out that in the latter case the exact equivalence of two treatments is seldom plausible and it is necessary to arrive at a definite recommendation that one treatment is to be preferred to another. The type I error rate is then 100%—the null hypothesis that the treatments are equivalent is always rejected. For the same reason the type II error rate is zero. As the treatments are unlikely to be exactly equivalent (and if they are, it does not matter which is recommended), neither of these errors is of any interest; the important error is that of recommending an inferior treatment, one which they refer to as type III.

This formulation has not been so widely accepted, but is well worth consideration at the design stage of a technological study.

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1 Marlow N. High frequency ventilation and respiratory distress syndrome: do we have an answer? Arch Dis Child 1998;78: P1-2.

Immaturity related lung hypoplasia: comment on current classification in neonatal death statistics

EDITOR,—The Office for National Statistics uses an algorithm to classify neonatal deaths. It is based on an hierarchical classification of causes to derive a single cause group for each death.3 Cause groups include, in descending order: congenital malformations, antepartum infection, immaturity related conditions, asphyxia/anoxia/trauma, external conditions, infections, other specific conditions, sudden infant deaths, and other unclassified conditions.

In applying the algorithm, we noted a surprisingly high frequency of deaths from malformations of the respiratory system, especially lung hypoplasia. This is one of the most common findings in neonates.1 Most cases are secondary to congenital malformations, antepartum infection, or pregnancy complications that inhibit lung development. As lung hypoplasia is secondary to preterm birth or premature rupture of membranes, it may be preferable to classify an infant death due to lung hypoplasia under immaturity related conditions, rather than congenital malformations.

We looked at how the reclassification of prematurity related lung hypoplasia deaths under immaturity related conditions, instead of congenital malformations, would affect the current hierarchical classification.

A detailed investigation of all 168 neonatal death records in 1993 with a code for lung hypoplasia (ICD 9: 7845) showed that 55 of these cases (32.7%) are secondary to immaturity related conditions (having one of the “immaturity” codes in the hierarchical classification) and have no other congenital malformations; 96 cases appear as secondary to other congenital malformations; and 17 appear as isolated lung hypoplasia or associated with other conditions such as hydrops fetalis. In the Office for National Statistics algorithm the 55 immaturity related cases would be classified as congenital malformation deaths because of the lung hypoplasia 7485 code. The cause groups for 1993 show that the total number of neonatal deaths classified under congenital malformations as the single cause is 1314.4 We conclude that a small percentage—that is, 4.2% or 55 of 1314—should preferably be classified as immaturity related conditions.

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BOOK REVIEWS


It is difficult to know where to start reviewing a book of 228 chapters, and some 355 contributors, all but a handful of whom come from North America, and most of whom, unsurprisingly are paediatricians. But as this work is essentially physiological, rather than about management, it will translate well into the practice of any country.

The overall layout of each chapter is good, with the potential for inconsistency that often dogs multiauthor books, not a feature. And as I moved around each chapter, I was confident that I would easily find what I was seeking.

Each of the book's sections—and there are 29-deals with a particular subject, dealt with first as it affects the fetus and then the neonate; this pattern is maintained throughout. Most of the chapters contain detailed information and are well referenced.

Who would find this book useful? It is clear from the preface that many found the first edition to be a valuable source book, a fact which led to the demand for this new edition. Clearly, paediatricians and neonatologists might find it most helpful, but so will materno-fetal medicine specialists and trainees. The latter might be disappointed at some of the more obstetric chapters, but there is plenty of other material which will be helpful and relevant. Physiologists, particularly undergraduates, will also probably find much to interest them.

In an era in which books find themselves unfashionable, this text remains relevant and the editors are to be congratulated on keeping their contributors, and their references, current.
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