



Scientists and the media must give a balanced view

A reported link between hormonal contraception and HIV infection deserved a more critical look, says James Shelton.

Women using hormonal contraception (HC) may face an increased risk of contracting HIV, according to a paper published online last month by *The Lancet Infectious Diseases* — especially women using a popular injectable contraceptive. *The New York Times* proclaimed that the injectable “appears to double the risk the women will become infected with HIV”. Other alarming media accounts followed. But what is the evidence? And how well was it reflected in the resulting media coverage?

The study suggested not only an increased risk for women using HC, but also increased transmission to their partners (R. Heffron *et al. Lancet Infect. Dis.* [http://dx.doi.org/10.1016/S1473-3099\(11\)70247-X](http://dx.doi.org/10.1016/S1473-3099(11)70247-X); 2011). And it implicated both injectables and oral contraceptives, although the latter did not reach statistical significance. Whether HC influences HIV risk is a serious concern, and has been the subject of numerous studies. But these studies have been observational and not randomized, and thus potentially biased by who chooses to use HC.

A classic way to interpret such evidence is to use causality criteria laid down by British epidemiologist Austin Bradford Hill. Applying some of these (in bold) I find the evidence far from persuasive.

Consistency. A notable number of studies have found no increased risk; others found only sporadic increases in disparate subgroups.

Strength of association. The reported twofold risk could be considered moderately supportive. However, because the number of infections among HC users and their partners were few, the wide confidence intervals included an increased risk of only a few per cent. And one alternative analytical approach was not significant. Furthermore, the study was a secondary analysis of data from an HIV-prevention trial addressing a different question, making it susceptible to additional bias because chance occurrences are more likely to be found and published.

Absence of alternative explanations. One plausible alternative is that couples who don't use HC are more likely to use condoms. The authors did attempt to control for this, but condoms were actively promoted and condom use seems greatly over-reported. The reported level of unprotected sex (about 10%) is inconsistent with HIV and pregnancy rates.

Biological plausibility. There seems to be no clear mechanism to explain how both forms of HC could increase the risk of both acquisition and transmission. The study found a small rise in genital viral shedding, the team's putative and seemingly necessary mechanism for transmission, but this was too small to explain the increased risk. Paradoxically, finding the same twofold risk for acquisition and transmission for both injectables and oral contraceptives actually strengthens the likelihood that reduced HIV exposure in the non-HC group can explain all the findings.

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This assessment is open to other interpretations, but why so little critical thinking in media reports? Let's look at the role of various actors.

Study authors: it taxes us to criticize our own work. However, authors should lay out critical issues for examination. The authors of the research paper did include some problems with the methodology and mentioned previous inconsistent findings. However, a prominent panel included in their paper, labelled “Research in Context”, cited only studies that found increased risk of acquisition. A more balanced representation was clearly in order. The issues of condom use and the increase in genital viral shedding that was seemingly inadequate to account for the transmission risk were not discussed, even though six authors co-authored another paper, from essentially the same study population, quantifying shedding's overall positive relationship with transmission.

Comment authors: it is crucial that accompanying comment articles in scientific journals lay out issues in a balanced, even critical, manner. Indeed, the title of the comment published alongside this study — “Hormonal contraception and HIV: an unanswered question” — made clear the uncertainty. And it did a good job on some issues, including the secondary nature of the analysis. But it overly emphasized those studies that reached a similar conclusion to the original study, and was uncritical on biological mechanisms, including viral shedding.

Journal: the journal's press release asserted the study's positive findings, and the quandary for contraceptive choice — omitting entirely any limitations or conflicting findings. In addition, journals frequently choose reviewers — who

probably approve publication — to write accompanying comments. Is that the best way to provide critique and perspective?

The New York Times: this led with the finding of increased risk and dwelled extensively on the implications of the conflict between prevention of unintended pregnancy and prevention of HIV. Readers had to reach paragraph nine for a description of the study. The only specific limitation of the study described was left to paragraph 16, and the sole reference to other human studies (paragraph 13) stated only that “at least two other rigorous studies” had found increased acquisition risk — no mention of work showing the opposite. Condom use and biological plausibility were mentioned only in passing. The article essentially presented the increased risk as established, and focused on the conflict it presented.

Such a conflict piques interest, but ill-serves what remains a complicated and serious issue. We deserve better, from all involved. ■

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