Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

SARS kangaroo lemonade? who will lead the way forward?

At time of press, severe acute respiratory syndrome (SARS) seems to be waning, and so the time is right "for a consensus meeting to review our treatment experiences and decide with industry, public-health officials, academia, and others the best strategy for moving forward", says Scott Hammer (Columbia University, NY, USA), who chaired a May 13 SARS conference at the New York Academy of Sciences (http://www.nyas.columbia.edu/sars; figure). "We don't know yet if SARS will be a cycle, so it will be a couple of years at least before we can relax", he warns, adding that, thus far, no organisation has taken the lead in arranging a meeting that might lead to evidence-based treatments.

"The issue now," Alison McGeer (Mount Sinai Hospital, Toronto, Canada) told *TLID*, "is that there are a number of potential treatments, but none of them leap out at you as being an obvious solution. All of them may be associated with worsening of disease or significent side-effects, and so the question is whether the benefit you get in the short term is greater than the potential longer term risk" (panel).

SARS current treatments: pros and cons

Ribavirin
- Pro: Possible immune modulatory effect
- Con: No in vitro activity

Interferon
- Pros: Good in vitro activity Although systemic levels are high, may not be adequate at site of infection (lung)
- Con: High interferon blood levels in patients

Immune globulin
- Pro: Passive immunity
- Con: Immune enhancement

Source: Alison McGeer, Sars: Developing a Research Response; http://www.niaid.nih.gov/sars_meeting.htm

In the outbreak at West Park Hospital in Toronto, several patients developed severe haemolytic anaemia, which was either a feature of SARS or a complication of treatment, possibly associated with the use of ribavirin, report Monica Avendano and colleagues (*CMAJ* fast-tracked article posted May 28; http://www.cmaj.ca).

Michael Gaffney

Scott Hammer at the New York Academy of Sciences

Avendano notes that although steroid use in SARS is controversial, her team's use of high-dose steroids may have helped keep three patients off ventilators. But for the most part, they gave supportive care: "You treat patients' fever, pain, electrolyte imbalances, dehydration; if they're anaemic, you transfuse; if they need oxygen, you give it; you control associated comorbidities such as diabetes", she says. "But even for those who have come through, it is now 6 weeks post-discharge, and although they are getting better, they are not well."

There is growing agreement that, as Hammer says, "the time for empiric therapy is over". But trying to do clinical trials is "terrifically complex" because all patients need maximum supportive care, and many physicians do not feel comfortable doing placebo-controlled trials in such circumstances. The way to begin to organise trials, suggests Hammer, "is to bring experts together in infectious diseases, virology, and antiviral medications, compile information from the most affected areas, and ask, 'do we really have anything we want to test in terms of currently available agents?' If so, then let's put a couple of multi-institutional or multi-national protocols together, get them through their IRBs, and be ready for the next cluster. It may not be until next season, but at least we're ready".

"In the meantime," he continues, "pursue the in vitro studies of potentially ineffective antiviral agents, look at all the preclinical and phase-one studies, and get them ready for human use. Although we can't do a placebo-controlled trial, we could do all the preclinical work, toxicology testing, pharmacokinetics and so forth, and actually be ready with a phase l/ll-type study and move quickly from there".

No clinically relevant agents have surfaced yet, however, says Catherine Laughlin (National Institute of Allergy and Infectious Diseases [NIAID], Bethesda, MD, USA), who heads NIAID's SARS drug discovery programme. She stresses the need for animal models, "since therapy most likely will end up being a combination of an antiviral plus something that specifically addresses pathology, such as an immune modulator or surfactant-type molecule that acts directly on the lung, and those can't be tested in vitro".

The bottom line, summarises WHO's Klaus Stöhr, "is that we need a treatment that is affordable, comes soon, and helps in the treatment of individual patients and reducing transmission". But for this to happen, he asserts, "we need cooperation from those who have the capacity to quickly develop the drugs", as well as from clinicians and laboratories.

So who will bring about such a collaboration? "WHO will do it, under my auspices or someone else's", says Stöhr. "It's something I feel we should play a role in, as we did in the detection of the causative agent." Stay tuned.

Marilynn Larkin