Antibiotics: Back to the Future

By David Shlaes — June 1, 2020

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I want to return to my favorite topic, antibiotics, viewed through the lens of the COVID-19 pandemic. Of course, as is probably true for all of us, my perspective is colored by my own history and experience. I want to share that with you before proceeding further.
as a microbiologist and infectious diseases specialist at the VA Medical Center in Cleveland, the head of the pulmonary department asked me if I would attend (supervise) on our medical intensive care unit for one month a year. I thought this was because he admired my ability to diagnose infections combined with the fact that I also understood blood gas data. In retrospect, I wonder if it wasn’t that he couldn’t find anyone else to take the job. This was before there was a recognized specialty in critical care medicine in the US (boards were established in 1985). Luckily, I was supported by pulmonologists so that I had backup on decisions involving the proper use of mechanical ventilators among other issues. The work was . . . intense. Often, on arriving in the morning, I could tell which patients had gotten into trouble the previous night by the number of antibiotic orders written for them. There seemed to be a correlation between the number of antibacterial, antifungal, and, for those truly desperate, antiviral drug prescriptions and the severity of their acute illness. I spent a great deal of time trying to hone the diagnosis of infection, if there was one, and, in the light of day, to “adjust” therapy to something more appropriate.

The US CDC estimates that about 50% of hospitalized patients receive at least one antibiotic
during their hospital stay. A study [1] from New York hospitals treating seriously ill COVID-19 patients showed that 89% received antibiotics. A recent review [2] showed that about 8% of patients hospitalized with COVID-19 infections had a complicating bacterial or fungal infection during their hospital stay, but that a striking 72% of all hospitalized COVID-19 patients received antibacterial or antifungal therapy. This reminded me of my own ICU experience. Given the numbers of such patients overwhelming our hospitals, this could represent up to a 50% increase in hospital antimicrobial use.

One thing that we know for sure is that the “you use it, you lose it” law of antimicrobial resistance rules. This means that the use of antibiotics, whether appropriate or not, will select for the emergence of resistant pathogens. Therefore, we can expect an increase in bacterial resistance in our hospitals – globally. The CDC recently reported that there about 3 million antibiotic resistant infections occurred every year in the US resulting in 48,000 deaths. Several years ago, the Review on Antimicrobial Resistance (I call it the O’Neill Commission since it was led by Jim O’Neill ex of Goldman-Sachs) estimated that there were 700,000 deaths worldwide annually due to resistant infections. They predicted [3] that given the trajectory of resistance, by 2050, 10 million lives will be at risk annually along with a $100 trillion-dollar loss to world GDP. No one imagined, I guess, that this might be accelerated by a global pandemic – but here we are.

This unexpected acceleration of resistance will occur at a time when our 95% of our completely inadequate new antibiotic pipeline is supported by small and fragile biotechs. Will it occur during a
time when we have learned at least one key lesson from COVID-19 – to invest in our future health? Will we finally realize that we have to support the antibiotic marketplace to prevent further bankruptcies of antibiotic biotechs? Will we find a way to encourage investment in our antibiotic pipeline again? Or will we ignore the counsel of untold experts and just wait for the next disaster to strike?

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