Preface

The current issue includes eight important papers: two review articles, one systematic and one narrative review, and six original research works. The review by Singh and Easwari opens the issue. It is aimed to evaluate the available treatments for peptic ulcer diseases, a very common disease that causes erosion of the linings of the digestive tract. Its prevalence is high, varying from 5 to 10% of the population. It is classically due to the use of non-steroidal inflammatory drugs or due to Helicobacter pylori bacterial infection in combination with excessive secretion of gastric hydrochloric acid. However, the management of this disease has become more complex in recent years due to antimicrobial resistance. The authors detail and discuss new therapeutic approaches for preventing and treating the disease, including evidence-based treatments and new therapies under investigation.

Shakib et al. carried out a systematic review of the in vivo and in vitro anti-hydatidosis effect of garlic, a species of the genus onion with antibacterial, antifungal, antiviral, and antiparasitic properties, with particular regard for its extracts. Hydatidosis is a parasitic disease caused by the larval stage of the Echinococcus granulosus complex and characterized by cysts localized in the disparate organs that are usually asymptomatic for years but may also be associated with clinical signs according to the number, location, size, and stage of the cysts. Their rupture may be fatal. Today, several treatments have been proposed, but a real golden standard medical treatment is not available. Shakib’s review included the analysis of 6 in vitro studies and 3 in vivo studies on mice models and demonstrated a significant beneficial effect of garlic extracts. These data are new and may be used as the base for future research and for the development of new antiparasitic formulations.

Inflammatory bowel disease is a chronic inflammatory disease of the gastrointestinal tract. Its management involves the use of 5-aminosalicylic acid and immunosuppressive agents, treatments associated with high rates of relapse, toxicity, resistance, or intolerance. On the other hand, monoclonal antibodies against tissue necrosis factor, albeit effective, are expensive and also related to side effects. Based on these considerations, Gandhi et al. performed an elegant experimental study aimed to test a polyherbal combination in experimentally induced inflammatory bowel disease in rats. Using a mathematical model and statistical analysis, polyherbal formulation, consisting of plant extracts of Aegle Marmelos, Bombax malabaricum, and Hollar-rhena antidysentrica in different ratios, was studied, and a precise dosage for each plant was achieved.

The fourth paper is an interesting clinical study aimed at defining the best empirical antibiotic treatment for patients with lower respiratory tract infections in Indonesia. Lower respiratory tract infections are one of the most common infectious diseases and the third cause of death worldwide. The epidemiological knowledge of the micro-organisms involved in different geographic areas may be crucial for a tempestive empirical treatment. The authors performed, firstly, a microbiologic analysis of the expectorate, which was performed on a large sample of subjects with lower respiratory tract infections, and then a drug sensitivity test was conducted, calculating the minimum inhibitory concentrations of four wide-spectrum antibiotics, i.e., cefditoren, azithromycin, amoxicillin-clavulanic acid, and cefixime. More than half of the cases of lower respiratory tract infections were caused by three bacteria (K. pneumonia, S. aureus, P. aeruginosa), and more than two-thirds by five bacteria. Gram-negative were present in more than two-thirds of the infections (K. pneumonia, P. aeruginosa, and A. Baumanii complex), followed by gram-positive (S. aureus and S. pneumonia). In vitro study demonstrated minimum inhibitory concentrations for cefditoren that effectively inhibit gram-negative and positive bacteria related to lower respiratory tract infections.

Dermatophytosis has increased over recent years. The dermatophytes, their etiological agents, are a group of closely related filamentous fungi that invade the keratinized tissues. Dermatophytes produce a wide range of enzymes, including carbohydrates, lipase, and proteases, such as keratinases, that are the key enzymes because they permit the invasion of the keratinized tissues. Trichophyton species represent one of the main diffuse dermatophytes. The use of herbal or natural substances and compounds in medicine is widely investigated since they offer therapeutic alternatives to chemical drugs, which are increasingly less effective due to microbial drug resistance. Some herbs contain compounds that have shown anti-fungal properties. Among them, Allium species have shown antifungal effects, even if their effectiveness on Trichophyton species was not known. In this regard, Sarlak’s study demonstrated, in a small but well-selected sample, the inhibitory effect of A. jesdianum and A. hirtifolium on the extracellular keratinase activity of T. mentagrophytes. The effect of aqueous and alcoholic extracts of A. jesdianum and A. hirtifolium on the activity of extracellular keratinase of T. mentagrophytes was also investigated, showing that the alcoholic extract had a more inhibitory power than the aqueous one and that the aqueous extract of A. jesdianum is the least effective in reducing keratinase activity.
Kumar et al. evaluated the antibacterial activity of fosfomycin among uropathogens causing cystitis. Cystitis is the most frequent infection seen in women, and significant antimicrobial resistance has been developed over the years. On the other hand, fosfomycin has shown its efficacy towards multi-drug resistant uropathogens inhibiting the synthesis of the bacterial cell wall. It is a well-tolerated oral drug with very few drug effects. Since it maintains stably high concentrations in urine for up to 24 hours, it can be administrated as one-time oral therapy in uncomplicated urinary infections. Kumar’s study confirms the efficacy of fosfomycin up to 95% in the treatment of multi-drug resistant uropathogens with uncomplicated urinary infections.

Candidiasis is one of the most important and common opportunistic fungal diseases in humans, occurring acutely, sub-acutely, and chronically in the skin, nails, vaginal mucosa, lungs, and gastrointestinal tract or systemically with blood poisoning, endocarditis, and meningitis. One of the main problems in treating patients with candidiasis is the increased fungal resistance to various drugs. Interesting research was conducted by Masoumizadeh et al. to study in vitro the antifungal activity of silver nanoparticles on Candida albicans, Candida dubliniensis, and Candida guilliermondii. The results, obtained by use of agar and macrodilution diffusion methods, demonstrated the absolute efficacy of the silver nanoparticles at low concentrations. In an electron microscope scan, the silver nanoparticles caused cells to slip and disintegrate by disrupting the natural process of fungal cells, causing the cells to shrink and lead to cell death. The current is another study showing antibacterial, antifungal, and antiviral properties of the silver ions that bind to the SH group of enzymes and proteins, influence electron transfer mechanism and cell respiration, influence electrochemical degradation of membrane and cell wall, induce generation of reactive oxygen species, and cause alteration of the DNA.

The last paper is an experimental study aimed at preparing the urapidil-loaded chitosan microparticles using small polyanionic electrolytes and poloxamer-188 in order to improve the mechanical strength and entrapment of the chitosan microparticles. Urapidil belongs to a class of sympatholytic antihypertensive drugs, which act as α1-adrenoreceptor antagonists, and are commercially available as capsules and vials, respectively, for oral and parenteral administration. On the other hand, carbohydrate-based chitosan is a natural multifunctional polycationic copolymer comprised of glucosamine and N-acetylglucosamine units and studied for drug delivery. However, there are very few chitosan-based pharmaceutical commercial products, probably due to the lack of stability and mechanical strength in environmental conditions and polymeric degradation under specific conditions. The study demonstrates the efficacy of the method to prepare urapidil-loaded chitosan microparticles using small anions and increasing amounts of poloxamer-188 with the aim to prolong drug release without compromising all pharmaceutical characteristics.

In conclusion, the current issue is full of interesting, albeit specific, scientific studies and data that rigorously confirm previous empirical knowledge and open the way for new antimicrobial treatments with particular regard to cases of resistance to common chemical antibiotics. Happy reading, everyone!