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Editor-in-Chief

Sarah Al Hussain, PharmD, MSc

Editors

Ali Aldayyen, PharmD

Alya Balghonaim, PharmD, MSc

Special thanks to

Asim Bushulaybi, Omar Alshwired,
Abdulmohsen Alhzom, Yousif
Bujubarah, Masouma Al-Obaidan,
Fatimah Al-Tammar, Hawra Al-
Salman, Zainab Al-Muhanna, Fatima
AlQanbar, Heba Alramadan, Dalia
Elmaghraby, Fatimah Al Doughan

For their contribution



KFU
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Pharmacy Practice

Drug Information Center

Department of Pharmacy Practice

College of Clinical Pharmacy

King Faisal University



Message from the Dean

The vision of College of Clinical Pharmacy is to be the role model in all areas of academics, research and community engagement. I am proud and pleased that after achieving its mission, college is on its way towards achieving its vision in all these areas. Our college has already excelled in community-based research, which mainly addressed health and medication issues of the community. We believe that analyzing the community problems and providing an elegant solution is a critical step for the success of our community services. Indeed, provision of Drug Information Services to healthcare professionals along with the general community is one of the answers to such issues. We are proud that our Drug Information Center is doing this job at its best. I have no doubt that Publishing the Newsletter by the Drug Information center team of our college is another step towards achievement of the college vision in addition to the KFU mission and identity.

I acknowledge Dr. Abdulaziz Almulhim, Head of Pharmacy Practice Department, the members of the Center and all the college faculty, staff, and students for this impressive work you are all engaged in.

Bandar Essa Aldhubiab, PhD

Message from the Department Head

For communities to flourish, giving, caring, empathy, and recognition are skills that should be passed on to our next generations. In the long history of humankind (and animal kind too) those who learned to collaborate and improvise most effectively have prevailed (*Charles Darwin*). As faculty members, our passion is not only to impart knowledge but also to inspire for changes. My gratitude goes to our inspiring faculty members who worked diligently to have this work of art comes true. My appreciation also extends to all our students , past and present, who put up with us during the preparation of this newsletter. All of the work presented henceforth was conducted at the Drug Information Center at The College of Clinical Pharmacy, King Faisal University.

Abdulaziz Almulhim, PharmD, BCPS

Nitrous Oxide Abuse

By Asim Bushulaybi; Omar Alshwired; Abdulmohsen Alhzom; Yousif Bujubarah – interns

Overview

Nitrous oxide (N_2O) is medically used as an inhaled anesthetic;¹ it is also known as di-nitrogen oxide, di-nitrogen monoxide, and laughing gas. It is non-flammable and colorless at room temperature with a chemical formula N_2O .² As a low-potency anesthetic gas,¹ N_2O is used as an adjuvant during general anesthesia induction and maintenance.³ It is also used for dental and surgical procedures, treatment of nicotine, opioids, and cocaine withdrawal. N_2O is also used in the food industry as it inhibits bacterial growth, fuel booster, dissociative anesthesia, and pain control.⁴ N_2O analgesic effect is caused by inducing endogenous opioid peptide release that binds to opioid receptors, which modulates pain processing via the activation of descending GABA and noradrenergic system in the dorsal horn of the spinal cord, whereas its anesthetic effect is secondary to the inhibition of NMDA receptors.⁵ Nitrous oxide lately acquired widespread popularity as a recreational drug.⁴ The gas is inexpensive, accessible, and usually available in form of cartridges, from which it is discharged into the mouth or a balloon to be inhaled.⁶

Adverse effects

Several adverse effects have been reported with the use of N_2O including hypoxia, hypertension, and arrhythmias. Headache, dizziness, nausea, vomiting, bowel distention, and rupture of the tympanic membrane may occur as well.⁷

Patient presentation and toxicity

Clinical findings include neurological manifestations (paresthesia in extremities, numbness, tingling, unsteady gait, weakness, fallings, Lhermitte's sign, ataxia). Laboratory findings include hematological manifestations (low hemoglobin and hematocrit levels, macrocytic anemia, vitamin B12 deficiency,

and elevated homocysteine and methylmalonic acid levels).⁸ These findings are thought to be secondary to the selective inactivation of vitamin B₁₂ by nitrous oxide.⁷ The main MRI finding is the presence of T2 signal hyperintensity in the spinal cord.⁸ Other clinical presentations include respiratory irritation, CNS depression, seizures, Interstitial emphysema, pneumomediastinum, and death may be noted.⁷

Management

Despite the fact that this area has not been extensively studied, successful treatment with vitamin B₁₂ and folate supplements have been proposed in many case reports in addition to supportive measures and exposure removal.⁷ supplementation with methionine has also been used.⁹

Case report

A case was reported in Saudi Arabia of a 28-year-old male who presented with complaints of numbness, tingling, and weakness of his leg that progressed rapidly with gait instability and falls for three days. The patient had a history of daily nitrous oxide inhalation, an average of 20 whippets daily over 2 to 3 years, and marijuana use. He was admitted and initially diagnosed with Guillain-Barre syndrome where intravenous immunoglobulin was started. After three days, his lower limb weakness increased significantly, and his paresthesia ascended to the level of nipple line. Magnetic resonance imaging (MRI) examination of the cervical spine revealed focal non-enhancing lesions extending from C4 to C6. Serum analysis was obtained and showed low level of vitamin B12 and high methylmalonic acid and homocysteine levels. The patient was successfully treated with supplemental 1000 µg/day of vitamin B12 intramuscular injections and 15 mg of folic acid tablets, where gradual improvement was observed.⁴

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Topical Timolol in The Treatment of Superficial Infantile Hemangioma

By Masouma Al-Obaidan; Fatimah Al-Tammar; Hawra Al-Salman – interns

Overview

Infantile hemangioma (IH) is a benign tumor that developed at birth or within few weeks after birth. The incidence estimated to occur in up to 5% of infants and premature infants as they are more prone to develop SIH. At the time of birth, it does not appear, or it appears in a small size. After several weeks of birth, it grows and multiplies. It could be a superficial tumor that appears in red or a deep tumor that appears in blue.¹ In 2019, The American Academy of Pediatrics (AAP) released the Clinical Practice Guideline for the Management of Infantile Hemangioma.

Treatment recommendations include oral propranolol, intralesional injection of triamcinolone and/or betamethasone, surgery, laser, as well as topical timolol. Topical timolol is recommended for thin or superficial infantile hemangioma.² Timolol is a non-selective antagonist of the β -adrenergic receptor. The mechanism of action of timolol in IH has not been well studied. Timolol 0.1% to 0.5% solution or gel is used twice up to 5 times daily to treat HI.³ Most of the case reports and published studies used ophthalmic preparations for topical administration. This article aims to review the efficacy and safety of topical timolol for IH.

Methods

We searched Clinical key, ScienceDirect, Trip Database, PubMed, Google Scholar, and Cochrane Library. The keywords that we used included ("hemangioma", "infantile hemangioma", "superficial infantile hemangioma", "infants", or "strawberry nevus") AND ("timolol", "topical β -blocker" or "topical timolol").

Also, we used the MeSH terms in PubMed with "superficial infantile hemangioma" and "topical timolol". The time frame was from 2015 to 2021. The results were screened to include studies of topical timolol use in infants to treat SIH. Studies of any other type of hemangioma, any other topical or oral β -blockers rather than topical timolol, and patients aged more than one year were excluded.

Results and Discussion

Several meta-analyses of randomized control trials and observational studies evaluated the efficacy and safety of topical β -blockers in treatment of SIH. Recently, a meta-analysis published included 11 randomized control trials with 1235 patients. Of those reported studies, six studies compared topical β -blockers (timolol and propranolol) with oral propranolol, placebo, corticosteroids, or laser therapy.

The results showed that topical β -blockers did not differ in the efficacy when compared with oral propranolol, (RR 0.96 [CI 95%; 0.91 - 1.02, $p=20$]), and was more effective when compared to the other interventions (RR 2.25 [CI 95%; 1.66 - 3.05, $p=0.00001$]). In safety standpoint, fewer incidence of adverse effects were reported with topical β -blockers when compared to propranolol (RR 0.05 [CI 95%; 0.01, 0.39, $p=0.0004$]).⁴

Another meta-analysis of 20 randomized control trials published in 2020 showed that topical timolol did not differ in the efficacy when compared with oral propranolol (propranolol, OR = 0.486, [CI 95% 0.165 - 1.426], $P = 0.189$; timolol, OR = 0.955; [CI 95% 0.700 - 1.302]; $P = 0.769$). However, it showed lower incidence of adverse effects (OR = 0.191; [CI 95%: 0.043 - 0.858] $P=0.031$). On the Other hand, topical timolol was more effective than topical imiquimod (OR = 2.561; 95%CI 1.182 - 5.550; $P = 0.017$). significant difference in the incidence of adverse No significant difference in the incidence of adverse effects was found when topical timolol compared to topical imiquimod (OR = 0.077; 95%CI 0.005, 1.206; $P = 0.068$).⁵

In 2018, a meta-analysis included five randomized controlled trials, three prospective cohort studies, and two retrospective cohort studies. Timolol group was compared to the control group. The control group included treatment with laser, observation, placebo, or oral propranolol. The difference in response rate was significant with timolol compared to control group (RR = 2.86, 95% CI 1.31–6.24); except for oral propranolol, the response rate was not different from the timolol group (RR = 0.99, 95% CI 0.70–1.42).⁶

Moreover, many case reports showed that topical timolol resulted in improvement of SIH. A case of a 3-month-old baby boy had SIH in an early stage that appeared as several clustered pinpoint vascular lesions localized at the parietal midline of the head in a small area. After four weeks of using 0.1% topical timolol, lesions improved with flattening and color

Another case reported for a 5-month-old baby girl developed an ocular lesion shortly after birth. After 3 weeks of using 0.5% timolol maleate ophthalmic solution twice daily, the size and thickness of the lesion reduced and complete clearance occur after 5 months. Furthermore, no observed hemangioma after 12 months of treatment discontinuation.⁸ In both cases, there were no reported side effects.^{7,8}

Conclusion

The current literature showed that there was no statistically significant difference between topical timolol and oral propranolol in the management of SIH. Moreover, timolol was associated with higher response rate as compared to other interventions. However, well-designed randomized control trials with adequate sample size are needed to determine the efficacy and safety of topical timolol. In addition, further studies are needed to confirm the specific mechanism of action of topical timolol in SIH.

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Palforzia – January 2020

By Asim Bushulaybi; Omar Alshwired; Abdulmohsen Alhzom; Yousif Bujubarah – interns

Overview

Palforzia is the first FDA-approved oral immunotherapy (OIT) for use in patients aged 4 to 17 years with a confirmed diagnosis of peanut allergy. It is indicated to mitigate allergic reactions secondary to accidental peanut exposure, including anaphylaxis.^{1,2} Its use is contraindicated in uncontrolled asthma patients and those with a history of eosinophilic esophagitis or other eosinophilic GI diseases.^{1,2} The commonly reported adverse events with Palforzia (in ≥5% of pediatric participants) include abdominal pain, vomiting, nausea, cough, upper abdominal pain, lip swelling, oral pruritus, oral paresthesia, throat irritation, rhinorrhea, sneezing, throat tightness, wheezing, dyspnea, pruritus, urticaria, anaphylactic reaction, rash, dysphonia, chest discomfort, and ear pruritus.^{1,2,3}

Three-phases dosing

1. Initial Dose Escalation Supplied as 5 blisters, single card containing 13 capsules to be administered in order (starting with level A) on a single day separated by 20 to 30 minutes observational period (Table 1). The patient should be observed at least 60 minutes after the last dose (level E). Repeat this phase if the patient cannot start Up-Dosing phase within 4 days.²

Table 1. Initial Dose Escalation²

Level	Total Dose
A	0.5 mg
B	1 mg
C	1.5 mg
D	3 mg
E	6 mg

2. Up-Dosing Start, if possible, the day after initial dose escalation. Up-Dosing consists of 11 levels administered in sequential order (from level 1) at 2-week intervals (Table 2). the administration of the

first dose of each level should be supervised for at least 60 minutes. If tolerated, patients can continue the dose level at home at a fixed time each day (preferably evening) with a meal. For those who cannot tolerate Palforzia, dose modification or discontinuation should be considered.²

Table 2. Up-Dosing

Level	Total Dose	Level	Total Dose
1	3 mg	7	120 mg
2	6 mg	8	160 mg
3	12 mg	9	200 mg
4	20 mg	10	240 mg
5	40 mg	11	300 mg
6	80 mg		

3. Daily Maintenance This phase is required to maintain the effect of Palforzia, where a dose of 300 mg should be administered daily after completing up-dosing phase (Table 3). Patients should be assessed regularly for possible adverse reactions.²

Table 3. Maintenance

Level	Total Dose
11	300 mg

Preparation and administration

- Palforzia is for oral use only. The capsule should not be swallowed, and the powder should not be inhaled.
- Empty the capsule or sachet powder onto few spoonfuls of room temperature or refrigerated semisolid food such as yogurt and applesauce, mix well, and consume the entire prepared mixture. Dispose of the opened capsule or sachet and wash hands immediately.²

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Safety of Ibuprofen in Managing COVID-19 Symptoms

By Zainab Al-Muhanna; Fatima AlQanbar; Heba Alramadan – interns

Overview

The coronavirus (COVID-19) pandemic is currently the most critical healthcare issue worldwide. Despite knowledge of Severe Acute Respiratory Syndrome coronavirus-2 (SARS-CoV-2), therapeutic options are poorly defined. Fever is known as the most commonly reported COVID-19 symptom; using antipyretic medication like acetaminophen or non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen is required in managing this symptom. Recently, the safety of ibuprofen in COVID-19 patients has been questioned after French Minister of Health published a recommendation on 14th March 2020 to avoid the use of NSAIDs.¹ Evidence of this claim was supported by the suggestion that ibuprofen can cause an imbalance of renin-angiotensin-aldosterone system (RAAS) and upregulate angiotensin-converting enzyme 2 (ACE2), a receptor for cell penetration of SARS-CoV-2, which results in facilitation of host cell infection. This review article evaluates the evidence around the safety of pharmacological use of ibuprofen in COVID-19-infected patients.

Discussion

The whole world is currently suffering from the COVID-19 pandemic. All countries are trying to overcome the pandemic consequences on all levels that affected health, social, psychological, and economic life. The French health minister published a statement regarding the use of ibuprofen; he claimed that ibuprofen might trigger a worse disease course if the patient retracted the virus.

A rapid systematic review of 73 studies was conducted to assess the effects of NSAIDs use,

including ibuprofen, in patients with acute viral respiratory infections or conditions caused by virus such as COVID-19, MERS, and SARS. Most of the included studies stated that only mild to moderate adverse events were noticed. Despite the limitations, this review indicates that there is no evidence to link the use of NSAIDs among COVID-19 patients with the development of with severe adverse events, acute healthcare utilization, long-term survival, or quality of life measures.²

On the other hand, a review of case-control studies suggests that using NSAIDs in patients with acute respiratory tract infections is associated with higher rates of complications. Based on previous data indicating that respiratory tract infections increase the risk of myocardial infarction (MI), the researchers wanted to examine if NSAIDs use in cases of acute respiratory tract infection will further boost MI risk. According to the review, the use of NSAIDs during acute respiratory tract infection increases the risk of MI by 3.4 folds (OR=3.41, 95%CI=2.80-4.16).³

A prospective cohort telephone questionnaire study was conducted between April 12 and June 1, 2020, in the Ministry of National Guard Health Affairs (MNGHA) in Riyadh, Saudi Arabia, which includes King Abdulaziz Medical City and King Abdullah Specialist Children's Hospital. The study aimed to assess the association of acute and chronic use of NSAIDs with worse COVID-19 outcomes. Adults aged 18 years or older with COVID-19-confirmed diagnosis were included and followed up from the index date until primary outcome occurrence, discharge, or up to 30 days. The study found no association between ibuprofen or other NSAIDs and worse COVID-19 outcomes. Both acute and chronic exposure to

NSAIDs did not reveal any significant association with COVID-19-related mortality, and, compared to non-NSAID users, no significant difference was noted neither in time to clinical improvement nor length of stay.⁴

Conclusion

Although many reasonable evidence are referring to a link between NSAIDs use and both respiratory and cardiovascular adverse effects, solid evidence regarding the risks of NSAIDs in COVID-19 patients is currently lacking. Accordingly, no restriction should be applied on the use of ibuprofen in patients with COVID-19.

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Cancer Screening and Prevention

By Dalia Elmaghraby, Clinical Lecturer

Screening

Early detection of cancer in asymptomatic individuals is called screening. Its aim is to detect the cancer in early and more treatable stages which can decrease morbidity and mortality. In general, treating cancer in early stages has less side effects than that of advanced stages.

Not all types of cancer can be identified early, and effective screening and treatment usually depend on several factors. First, the target disease should be of a common type, such as breast, lung, colorectal, cervical, and prostate cancer. In addition, effective treatment which reduces mortality and morbidity should be available. Finally, screening modalities should have some features (i.e., tolerable, non-invasive, cost-effective, and with low rates of false positive and false negative results).

Prevention

Various modifiable and nonmodifiable risk factors have been linked to a wide array of cancers. Since the nonmodifiable factors (such as sex, age, and family history) cannot be controlled, interventions to control the modifiable ones should be

encouraged. Those, in turn, can prevent or reduce the risk of cancer, including:

- Avoiding active and passive smoking;
- Controlling and maintaining a healthy weight;
- Healthy eating, fruits and vegetables rich diet;
- Regular physical activity;
- Regular medical care, avoiding infection, hepatitis B and human papillomavirus vaccines;
- Controlling environmental risk factors, such as reducing the exposure to ultraviolet (UV) radiation, ionizing radiation, and air pollution.

References

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4. The National Comprehensive Cancer Network (NCCN)

College News and Achievements

By Sarah Al Hussain, Teaching Assistant

1. Research Day

Under the patronage and presence of His Excellency Dr. Mohammad Al-Ohali, the University President, College of Clinical Pharmacy has celebrated the Research Day exhibition on Monday, April 5, 2021. Research Day featured poster displays and demonstrations to highlight the research advances and accomplishments of the faculty members and students. It provided an excellent opportunity to share and learn about the current research activity within the college and to recognize the researchers' efforts.

The event was held in the presence of their excellencies, the Vice-President for Postgraduate Studies and Scientific Research, Dr. Majed Al-Shammari, the Acting Dean of Scientific Research, Dr. Mansour Al-Yahya, the Dean of College of Clinical Pharmacy, Dr. Bandar Al-Dhubaib, and the Vice-Dean, Dr. Mervat Al-Mustafa, and members of the college staff and students.



2. Medication Therapy Management Clinic

Under the supervision of one of our clinical pharmacists, a new dedicated medication therapy management (MTM) clinic has opened. MTM provides distinct services to to enhance medication use, improve adherence, and reduce adverse events risk, where the pharmacist in-charge works closely with both patients and physicians to solve a wide array of medication-related problems and helps improve patient care. Congratulations!

The clinic is located at King Faisal University (KFU) polyclinics, and is open every Sunday and Wednesday, 8:00am-12pm.



3. Saudi Pharmacist Licensure Examination

We are very proud to announce that College of Clinical Pharmacy, King Faisal University, has achieved an impressive passing rate of 98% on the Saudi Pharmacist Licensure Examination (SPLE) during the period of January 2018 till February 2021.

We would like to take this opportunity to thank and congratulate everyone who were involved, students and faculty members, for reaching another milestone. Congratulations on such a remarkable achievement. Well done! We wish you all the best in your career.

إحصائية أداء خريجي الجامعات/الكليات في اختبار الرخصة السعودية لمزاولة مهنة الصيدلة

خلال الفترة 1 يناير 2018 - 28 فبراير 2021

الجامعة / الكلية	نسبة النجاح	المقدمين	متوسط درجة المتفكرين
جامعة الإمام عبد الرحمن بن فيصل - الدمام	99%	186	614
جامعة الملك سعود بن عبد العزيز للعلوم الصحية - الرياض	99%	158	607
جامعة الملك فيصل - الهفوف	98%	122	595
جامعة القصيم - بريدة	97%	230	586
جامعة طيبة - المدينة المنورة	97%	107	591
جامعة الملك سعود - الرياض	95%	318	602
جامعة تبوك - تبوك	95%	41	587
جامعة الملك عبد العزيز - جدة	94%	206	603
جامعة الأميرة نورة بن عبد الرحمن - الرياض	93%	381	576
جامعة حائل - حائل	90%	30	571
جامعة أم القرى - مكة المكرمة	89%	168	582
كلية ابن سينا الأهلية للعلوم الطبية - جدة	89%	150	577
جامعة الطائف - الطائف	88%	190	580
جامعة القصيم - عنيزة	82%	34	586
جامعة المعرفة - الرياض	81%	143	575
جامعة جازان - جازان	79%	278	570
جامعة الباحة - الباحة	77%	65	579
كلية محمد المنصور للعلوم الطبية - الدمام	74%	39	555
جامعة الملك خالد - أبها	71%	338	560
جامعة الأمير سطام بن عبد العزيز - الدمام	68%	98	551
جامعة الحدود الشمالية - عرعر	68%	76	564
جامعة رياض العلم - الرياض	61%	95	565
جامعة الجوف - سكاكا	60%	30	567
جامعة شقراء - شقراء	57%	144	559
كلية بريدة الأهلية - بريدة	46%	56	555

4. Recent Publications


January 2021

- **Dr. Khalid Alhussain, Assistant Professor**

- **Alhussain K**, Kido K, Dwibedi N, LeMasters T, Rose DE, Misra R, Sambamoorthi U. Identifying knowledge gaps in heart failure research among women using unsupervised machine-learning methods. *Future Cardiol.* 2021 Jan 11.

FUTURE CARDIOLOGY, AHEAD OF PRINT | SHORT COMMUNICATION

Identifying knowledge gaps in heart failure research among women using unsupervised machine-learning methods

Khalid Alhussain , Kazuhiko Kido, Nilanjana Dwibedi, Traci LeMasters, Danielle E Rose, Ranjita Misra & Usha Sambamoorthi

- **Dr. Abdulaziz Almulhim, Assistant Professor**

- Alamer AA, **Almulhim AS**, Alrashed AA, Abraham I. Mortality, Severity, and Hospital Admission among COVID-19 Patients with ACEI/ARB Use: A Meta-Analysis Stratifying Countries Based on Response to the First Wave of the Pandemic. *Healthcare (Basel)*. 2021 Jan 28;9(2):127.

Open Access Article

Mortality, Severity, and Hospital Admission among COVID-19 Patients with ACEI/ARB Use: A Meta-Analysis Stratifying Countries Based on Response to the First Wave of the Pandemic

by Ahmad A. Alamer ^{1,2,*} , Abdulaziz S. Almulhim ³ , Ahmed A. Alrashed ⁴  and Ivo Abraham ^{1,5} 

4. Recent Publications

February 2021

- **Amal AbuAlhommos, Clinical Lecturer**

- Raad SE, **AbuAlhommos AK**. Female awareness about the preconception use of folic acid supplements in childbearing age: A cross-sectional study. Int J Clin Pract. 2021 Feb 12:e14091.



- **Kareem El-fas, Clinical Lecturer**

- Masoud AT, Zaazouee MS, Elsayed SM, Ragab KM, Kamal EM, Alnasser YT, Assar A, Noureden AZ, Istiah LJ, Abd-Elgawad MM, Abdelsattar AT, Sofy AA, Hegazy DG, Femía VZ, Mendonça AR, Sayed FM, Elmoursi A, Alareidi A, Abd-Eltawab AK, Abdelmonem M, Mohammed OM, Derballa EA, **El-Fas KA**, Abdel-Daim MM, Abushouk AI; KAP-COVIDGLOBAL Investigators. KAP-COVIDGLOBAL: a multinational survey of the levels and determinants of public knowledge, attitudes and practices towards COVID-19. BMJ Open. 2021 Feb 23;11(2):e043971.



4. Recent Publications

April 2021

- **Dr. Abdulaziz Almulhim, Assistant Professor**

- Alamer A, Alrashed AA, Alfaifi M, Alosaimi B, AlHassar F, Almutairi MM, Howaidi J, Almutairi W, Mohzari Y, Sulaiman T, AlJedai A, Alajami HN, Alkharji F, Alsaeed A, Alali AH, Baredhwan AA, Abraham I, **Almulhim AS**. Effectiveness and safety of favipiravir compared to supportive care in moderately to critically ill COVID-19 patients: A retrospective study with propensity score matching sensitivity analysis. Curr Med Res Opin. 2021;1.

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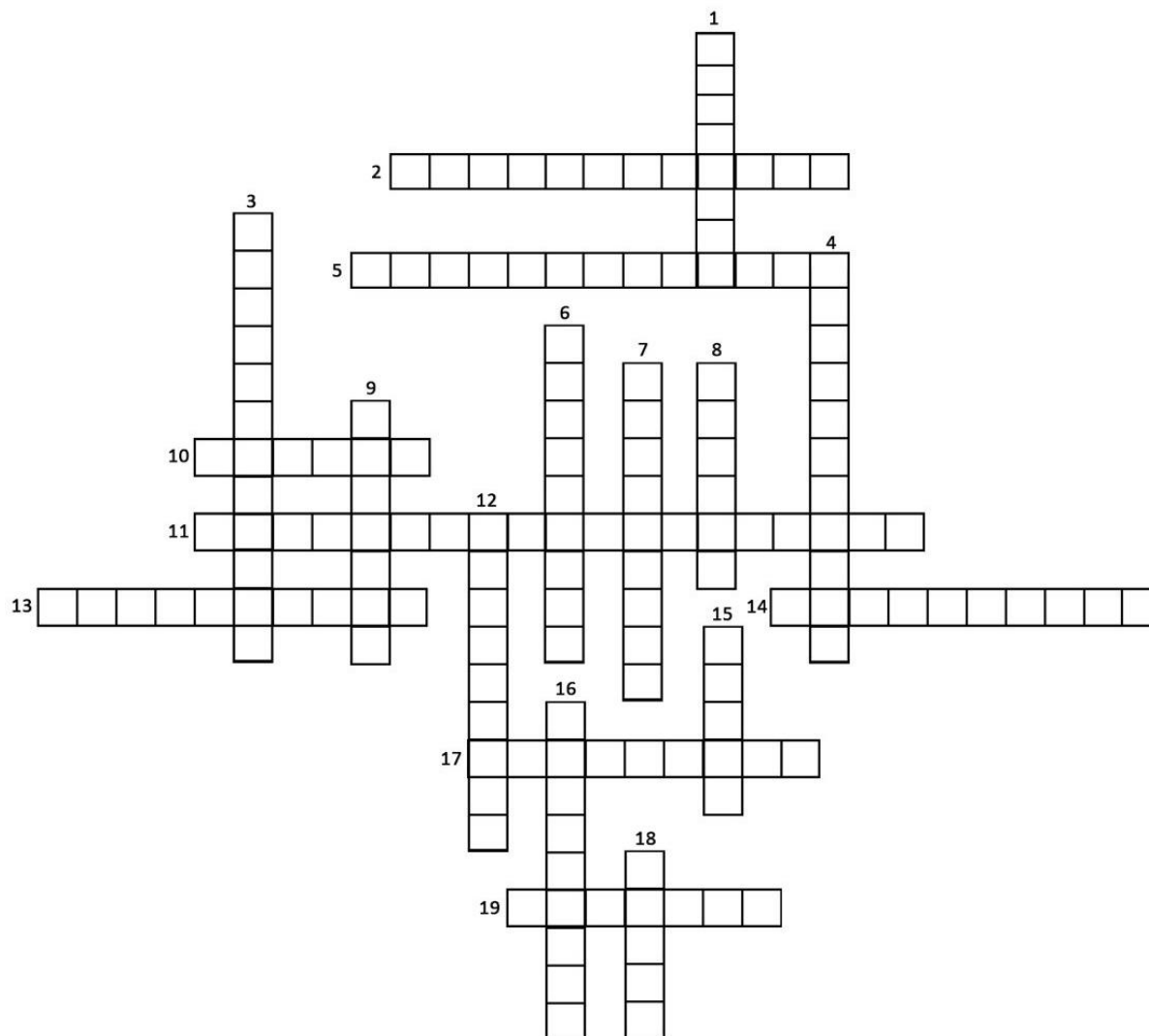
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COVID-19
Effectiveness and safety of favipiravir compared to supportive care in moderately to critically ill COVID-19 patients: A retrospective study with propensity score matching sensitivity analysis
 Ahmad Alamer ✉, Ahmed A Alrashed, Mashael Alfaifi, Bandar Alosaimi , PhD, Fatimah AlHassar, Malak M. Almutairi, Jude Howaidi, Wedad Almutairi, Yahya Mohzari, Tarek Sulaiman, Ahmed AlJedai, Hamdan N. Alajami, Fatima Alkharji, Ali Alsaeed, Alaa H. Alali , Abdullah A. Baredhwan , Ivo Abraham  & Abdulaziz S. Almulhim ...show less
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Learn with Fun!

Pharmacy Crossword

By Asim Bushulaybi, Omar Alshwired, Abdulmohsen Alhzom, Yousif Bujubarah – interns



Across

2. Generic name for Crestor
5. Indication for Warfarin/Coumadin
10. Ibuprofen
11. Another name for HCTZ
13. Indication for Amoxil
14. Generic name for Prinivil
17. Levothyroxine
19. Antidepressant drug

Down

1. Generic name for Ultram
3. Zithromax
4. It causes swollen lymph nodes and treated with penicillin
6. Generic name for Glucophage
7. ProAir HFA
8. Brand name of Clopidogrel
9. Hydrocodone-APAP
12. Brand name for Metoprolol
15. Brand name for Simvastatin
16. Indication for the drug Oxycodone
18. Alprazolam

Antibiotics – Use it wisely!

By Fatimah Al Doughan, Teaching Assistant



Antibiotic resistance, a shadow that follows each new antibiotic.

Stay tuned for the next issue!