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Kongremize 15 davetli konuşmacı katılım sağlamıştır. Bu katılımcıların 7'si farklı dünya ülkelerinden olup, dağılımı ise 5 farklı ülkedir. Davetli konuşmacıların tamamı kongremize iştirak edip konuşmalarını kongre başkanının oturum başkanlığında sunmuşlardır.

Bildiri Sunum ve Dağılımları Türkiye		**Bildiri Sunum ve Dağılımları Ülke Dışı**	
Sözel Sunum Türkiye:	42	**Sözel Sunum Yurt Dışı:**	47
Poster Sunum Türkiye:	01	**Yurt Dışı Ülke Dağılımı:**	11 Farklı Ülke
Türkiye Toplam Bildiri Sunumu:	43	**Toplam Yurt Dışı Bildiri Sunumu:**	47

Kongremize toplam gelen bildiri sayısı 90 adettir. 11 farklı dünya ülkesinden 47 adet bildiri sunulmuş olup tamamı sözel sunumdur. Bu sayı kongre toplam katılımın %52'si yabancı katılımcıdan oluşmaktadır. Türkiye'den katılım ise sözel 42 poster 01 toplam 43 bildiri gelmiştir. Türkiye dışı katılımcıların ülke dağılımları kitabın ikinci bölümünde yer alan özetlere ait bilgilerin içerisinde yer almaktadır.

Kongremiz bir gün sürmüş olup, ülke içi ve ülke dışından toplam dinleyici dahil katılımcı sayısı ülke dışından 296 kişi Türkiye'den ise 179 kişidir.

Kongremizde kabul edilen bildirilerinin tamamı kongre başkanı, düzenleme kurulu başkanı ve oturum başkanlarının yönetimi ile idaresi doğrultusunda yukarıdaki tablolarda beyan edildiği şekilde sunumu yapılmıştır.

Kongremiz 2019 yılı akademik teşvik kriterleri kapsamında olup, 17/01/2020 tarihli ve 31011 sayılı Resmî Gazete'de yayımlanan 16/01/2020 tarihli ve 2043 sayılı Cumhurbaşkanı Kararı Uyarınca ilgili yayınlanan yönetmelik kapsamında değerlendirilmektedir.

Yukarıdaki beyan edilen bilgilerin doğruluğunu denetleme kurulu ve kongre başkanı olarak kabul ve teyit eder saygılarımızı sunarız.

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Kongre Başkanı

Prof. Dr. Esra BAĞDA
Kongre Başkanı

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Assist. Prof. L. Santhosh KUMAR	**India**
Assist. Prof. Perihan ABAY	**Türkiye**

15 invited speakers participated in our congress. 7 of these participants are from different countries of the world, and their distribution is 6 different countries. All of the invited speakers attended our congress and presented their speeches under the chairmanship of the congress president.

Presentation And Distributions Türkiye		**Paper Presentations And Distributions Out Of Country**	
Oral Presentations Türkiye:	42	**Abroad Oral Presentations:**	47
Poster Presentation Türkiye:	01	**Abroad Country Distribution:**	11 Different Country
Total Presentation Türkiye:	43	**Total Abroad Presentations:**	47

The total number of papers submitted to our congress is 93. 47 papers from 11 different world countries were presented and all of them were oral presentations. This number consists of foreign participants, 52% of the total participation in the congress. Participation from Türkiye is, 42 verbal and 01 posters a total of 43 papers. Türkiye distribution of out-of-country participants is included in the information on the abstracts in the second part of the book.

Our congress lasted for one day and the total number of participants, including the audience, from the country and abroad is 296 people from abroad and 179 people from Turkey.

All of the papers accepted at our congress were presented as stated in the tables above, in line with the management and administration of the congress chair, the organizing committee chair and the session chairmen.

Our congress is within the scope of the academic incentive criteria for 2019 and is evaluated within the scope of the relevant regulation in accordance with the Presidential Decision dated 16/01/2020 and numbered 2043 published in the Official Gazette dated 17/01/2020 and numbered 31011.

As the organizing committee and the congress president, we acknowledge and confirm the accuracy of the above-declared information and present our respects.

Prof. Dr. Ümran SEVİL
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AGE-RELATED ALTERATIONS IN THE GENE EXPRESSIONS OF TRANSIENT RECEPTOR POTENTIAL CANONICAL 6 (TRPC6) AND VANILLOID 4 (TRPV4) CHANNELS IN THE AORTA OF HYPERTENSIVE PATIENTS WITH CORONARY ARTERY DISEASE **63**
Algül Dilara DOKUMACI, Belgin ALAŞEHİRLİ, Akif Serhat BALCIOĞLU, Sibel OĞUZKAN BALCI, Nadire ESER, Mehmet ACIPAYAM

ANTİTROMBOTİK İLAÇ KULLANAN HASTALARDA ULTRASONOGRAFİ EŞLİĞİNDE KAUDAL EPİDURAL STEROİD ENJEKSİYONUNUN ETKİNLİĞİ VE GÜVENİLİRLİĞİ **72**
Ali GÜLER

COVID-19 TANILI YOĞUN BAKIM HASTALARINDA TROMBOEMBOLİK KOMPLİKASYONLARIN DEĞERLENDİRİLMESİ: RETROSPEKTİF KOHORT ÇALIŞMASI **77**
Ayse Zeynep Turan CIVRAZ, İpek DÜZYOL, Emine ATLI, Çiğdem ÇAĞLAYAN, Emine YURT, Adnan ATA, Mehmet YILMAZ, Berna KARAKOYUN

THE EFFECT OF CAPCAICIN TREATMENT ON COGNITIVE DECLINE IN STZ-INDUCED RATS **86**
Büşra ERTAŞ

SİRKADİYEN RİTİM VE SAĞLIK **94**
Deniz MIHÇIOĞLU

26 HAFTALIK GEBELİKTE SERVİKAL VARİSLERİN ABONDAN KANAMASI: NADİR BİR OLGU SUNUMU VE LİTERATÜRÜN GÖZDEN GEÇİRİLMESİ **104**
Derya BURKANKULU

COVID-19 PANDEMİ SÜRECİNDE SPORCU BESLENMESİ VE D VİTAMİNİ KULLANIMININ ÖNEMİ **112**
Ali Serdar YÜCEL, Hayrettin GÜMÜŞDAĞ, Süleyman DERMAN, Murat KORKMAZ

TÜRKİYE'DE GELENEKSEL VE TAMAMLAYICI TIP UYGULAMALARININ MEVCUT STANDARTLARI VE İYİLEŞTİRME ÖNERİLERİLERİNİN LİTERATÜR AÇISINDAN DEĞERLENDİRİLMESİ **126**
Hayrettim GÜMÜŞDAĞ, Ali Serdar YÜCEL, Süleyman DERMAN, Murat KORKMAZ

ACİL SERVİS KULLANIMI ÜZERİNDE EĞİTİM VE KETLEŞMENİN ETKİSİNE YÖNELİK ÇOK DEĞİŞKENLİ ANALİZ **143**
Erkan BOĞA

MİDE KANSERİ CERRAHİSİ SONRASI PANKREATİK FİSTÜLE YAKLAŞIM; OLGU SUNUMU **149**
Serdar ŞENOL

DEVELOPMENT OF IN SITU GELLING SYSTEM CONTAINING KETOROLAC TROMETHAMINE LOADED NANOPARTICLES: FORMULATION AND CYTOTOXICITY ASSAY **154**
Tilbe ÇEVİKELLİ, Umay Merve GÜVEN, A. Alper ÖZTÜRK

DEVELOPMENT OF *IN SITU* GELLING SYSTEM CONTAINING KETOROLAC TROMETHAMINE LOADED NANOPARTICLES: FORMULATION AND CYTOTOXICITY ASSAY

Tilbe ÇEVİKELLİ[1], Umay Merve GÜVEN[1], A. Alper ÖZTÜRK[2]

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Abstract: Oral *in situ* gelling systems provide many advantages over the conventional oral dosage forms in various aspects. *In situ* gels undergo transformation from solution to gel like consistency, due to change in their physicochemical properties. *In situ* gels also combines the advantages of both gels and solutions by providing environment specific gel forming solution and capable of producing the sustained and controlled drug delivery. Pluronic F-127 is a thermoresponsive polymer that exists in a liquidstate at low temperature, while converting into a gel upon increasing the temperature of the medium. It is a non-ionic and amphiphilic polymer, while being the least toxic and most commonly used thermosensitive polymer in pharmaceutical formulations. In this study, ketorolac tromethamine (KT), a non-steroidal inti-inflammatory drug with a short plasma life approximately 5.5 h, was loaded into Eudragit RS 100 nanoparticles produced by the spray-drying method. KT loaded nanoparticles implemented in the Pluronic F-127 based *in situ* gelling system for controlled released oral delivery. Characterization of the nanoparticles and gel system was conducted, and the safety of the novel drug delivery system was evaluated by the MTT assay. The nanoparticle loaded *in situ* gel system found to be safe and promising for oral delivery of ketorolac tromethamine.

Keywords: Ketorolac Tromethamine, Nanoparticle, *In-Situ* Gel, Spray Drying, Cytotoxicity

INTRODUCTION AND THEORETICAL FRAMEWORK

Ketorolac Tromethamine (KT) is a non-steroidal anti-inflammatory drug (NSAID), acting as a non-selective COX inhibitor, with a short plasma half-life ($t_{1/2} \approx 5.5$ h) (Savaroglu et al., 2013). Nanoparticles (NPs), are good drug delivery candidates as they can enhance safety and efficiency of local or systemic drug delivery (Abdelkader et al., 2012). Methods used for formulating NPs may vary; in this study a mechanical method, spray drying was applied for production of Eudragit RS 100 (ERS), a copolymer of ethyl acrylate, methyl methacrylate and low content of methacrylic acid ester, based nanoparticles (Ozturk et al., 2017).

In situ gels, basically utilizes polymers which undergo transformation from solution to gel like consistency, due to change in their physicochemical properties. Combines the advantages of both gels and solutions by providing environment specific gel forming solution and capable of producing the sustained and controlled drug delivery. *In situ* forming polymeric drug delivery systems are in solution form before administration in the body, but once administered, undergoes gelation *in situ* to form a gel. Compared to conventional oral dosage forms, *in situ* forming drug delivery systems possess potential advantages for oral delivery like; simple manufacturing process, reduced frequency of administration, improved patient compliance and comfort and controlled drug release.

Pluronic F127 is a thermoresponsive polymer that exists in a liquidstate at low temperature, while converting into a gel upon increasing the temperature of the medium. It is a non-ionic and amphiphilic polymer, while being the least toxic and most commonly used thermosensitive polymer in pharmaceutical formulations.

PURPOSE

In this study, KT loaded *in situ* gelling system with Pluronic F-127 containing ERS NPs are produced by nano spray drying method and characterized, while *in vitro* cytotoxicity characteristics being evaluated for the purpose of developing a novel oral delivery system for KT.

SCOPE

Scope of this work was to design a novel oral drug delivery system for delivery of a non-steroidal anti-inflammatory drug; by combining several advantages of the nanoparticular systems and the *in situ* gelling systems over the conventional oral dosage forms.

METHOD

Preparation of Nanoparticles and *In Situ* Gelling System

NPs were prepared using Nano Spray-Dryer (B-90, Büchi Labortechnik AG, Switzerland). For the preparation of NPs, ERS was dissolved in methanol prior to the addition of KT. Spray-drying conditions and NPs ingredients are summarized in Table 1 and Table 2, respectively.

Polymeric solutions were prepared using the cold method for in situ gelling system. Pluronic F-127 was dispersed in cold water with continuous magnetic stirring at 4°C for at least 24 hours. Formulation studies were started by determining constituent ratios. Pluronic F-127 aqueous solution with a concentration of 20% has a gelling temperature at 37°C.

Characterization of Nanoparticles

Particle size (PS), polydispersity index (PDI) and zeta potential (ZP) of NPs were analyzed by a Zetasizer Nano ZS (Malvern Instruments, UK). Entrapment efficiency into nanoparticles were determined by the indirect method and the release profile of KT from both NPs and *in situ* gel system was determined by the dialysis bag method. All of the *in vitro* characterization studies were conducted in triplicate.

Cell Culture

Cells were grown in Dulbecco's modified Eagles medium: Nutrient mixture F12 (DMEM/F12) containing 5.5 mmol/L D-glucose supplemented with 10% heat-inactivated fetal bovine serum (FBS) and 1% antibiotic (100 U/mL penicillin and 100 mg/mL streptomycin) at 37 °C in a humidified incubator with 5% CO_2. Under this condition, it was determined that the doubling time was approximately 24 h for NRK-52E cells.

Cytotoxicity Assay

NRK-52E rat kidney cells were seeded at 10^4 cells into each well of 96-well plates. After 24 h, nanoparticle and in situ gel formulations were added to wells in various concentrations, accordingly (Alpertunga et al., 2014).

Cytotoxicity test was performed by using MTT test. The test principle is that MTT, yellow colored water soluble 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyl-tetrazolium bromide salt, is reduced to an insoluble purple formazan product by the mitochondrial succinate dehydrogenase, which belongs to the mitochondrial respiratory chain and is only active in viable cells, in the presence of an electron coupling reagent. In every test, PBS as negative control and 1% DMSO as solvent controls were used. For all concentrations, test

was repeated in triplicate. IC_{50} was expressed as the concentration of sample caused an inhibition of 50% in cell viabilities.

RESULTS

Characterization of Nanoparticles

PS, PDI, ZP values and the entrapment efficiency into NPs are found to be convenient for oral delivery, and drug release profile from *in situ* gel system was applicable for providing controlled release of the KT.

Cell Culture and Cytotoxicity Assay

As the MTT assay for KT loaded nanoparticles, cell viabilities were calculated as 100% for all doses applied, and found to be safe for oral application (Figure 1). *In situ* gels containing KT loaded nanoparticles exhibited dose dependent cell viability profile (Figure 2) and IC_{50} value was calculated as 59.9% in convenience with the literatüre, and found to be applicable for oral delivery.

CONCLUSION

Eudragit RS 100 nanoparticles were prepared for analgesic delivery of Ketorolac Tromethamine by nano spray-drying method and incorporated into *in situ* gelling system prepared using cold method by the Pluronic F-127. The particle size, zeta potential and polydispersity index, entrapment efficiency and cytotoxicity analysis of formulations justified that in situ gelling system formulations for oral delivery of ketorolac is safe and promising.

TABLES

Table 1. Spray-Drying Conditions

Inlet Temperature	Outlet Temperature	Pump Level	Spray Level
100°C	54°C	4	100 %

Table 2. Nanoparticle Ingredients

Formulation Code	ERS	KT	Methanol
NP-Blank	1 g	-	100 mL
NP-1	1 g	0.5 g	100 mL

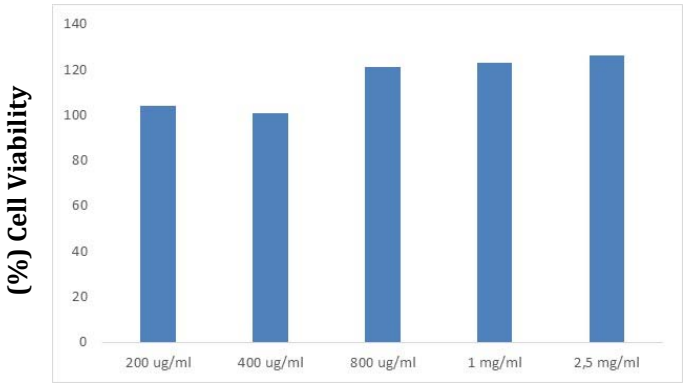

Figure 1. Cytotoxicity Assessment by MTT Assay In NRK-52E Cells Following the Exposure of Various Concentrations of KT Loaded Nanoparticles for 24 Hour

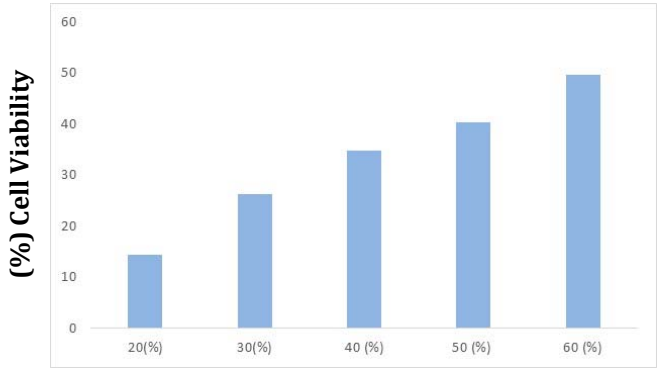

Figure 2. Cytotoxicity Assessment by MTT Assay In NRK-52E Cells Following the Exposure of Various Concentrations of KT Loaded Nanoparticle Containing *In Situ* Gels for 24 Hour

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TİLBE ÇEVİKELLİ, UMAY MERVE GÜVEN, ALPER ÖZTÜRK

DEVELOPMENT OF IN SITU GELLING SYSTEM CONTAINING KETOROLAC TROMETHAMINE LOADED NANOPARTICLES: FORMULATION AND CYTOTOXICITY ASSAY

Yukarıda bilgileri bulunan çalışma ile ilgili kişi(ler) kongremize SÖZEL sunum yaparak katılım sağlamıştır. Kendilerine katılımlarından dolayı teşekkür eder; gelecek bilimsel hayatlarında başarılarının devamını dileriz.

The person(s) concerned with the above information on the study participated in our congress by making a VERBAL presentation. We thank them for their contribution; we wish them continued success in their future scientific lives.

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