
بسم الله الرحمن الرحيم

NeuroMaPC

مرکـــز مدولاسیـــون عصبی و درد

حرکت برای زندگی بهتر

کتابچه معرفی و شرح فعالیتها

مصوب وزارت بهداشت ، درمان و آموزش پزشکی

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بنام خدا

پیشگفتار

به نام خداوند دانش نواز	خداوند درمانگر چاره ساز
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خدای شفابخش وجانبخش ما	خدای حکیم و روانبخش ما
شفا او ببخشد به دست طبیب	که تا چاره سازیم درد حبیب

در چرخه تولید علم و دانش و زنجیره ارزش آفرینی، آموزش پایه و اساس هر حرکتی است و میوه درخت آموزش ، پژوهش است. پـژوهش، شـرط پیشـرفت و زمینـه سـاز توسعه و رفاه در جوامع انسانی است.

سالهاست ساخت دانشگاهی ایران در مقابل اتهام ابتر بودن دانش خود سکوت کـرده ، ولی آرام آرام حاصل آن صبر و سکوت در توسعه فناوری های پیشرفته و بی نیـازی و استقلال بخش هایی از زیست بوم فناوری کشور دیده می شود

از تاسیس موسسات آموزش عالی در ایران حدود دوهزارسال مـی گـذرد و از تاسـیس پژوهشگاه امروزی نیز مطابق مستندات تاریخی بیش از صد سال مـی گـذرد .هرچنـد پیش از آن بیمارسـتان ری و بغـداد نمونـه موسسـات آموزشـی- پژوهشـی- درمـانی هستند که در دوره طلایی اسلامی و همزمان با دوران تاریکی پیش از نوزایی در اروپـا راه اندازی شده بود. ویژگی این مراکز آن بود که همزمان با آموزش پزشکان ، پژوهش در راههای پیشگیری، تشخیص و درمان بیماری ها را در کنـار ارائـه خـدمات ممتـاز درمانی در عصر خود ارائه می کردند.

با نگاهی که به بیمارستان ها و درمانگاه های دوران طلائی تمدن اسلام و ایران ، نکته دیگری نیز جلب نظر می کند و آن الگوی مدیریت منابع است که بر مبنای سنن الهی با استفاده از ظرفیتهای قوانین و دستورات اسلام بنا نهاده شده است.

سال پیش وقتی در کنار دوست عزیزم جناب آقای دکتر علی رزم کن ،ایده اولیه راه اندازی مرکز را در ذهن می پروراندیم پرسشها و مشکلات زیادی مقابل روی ما بود و برای حل آنها جز تلاش و توکل، بدلیل نوبودن موضوع پژوهش در بخش خصوصی درمان، مطالعه تاریخ موفقیت ها و شکست ها باید شجاعانه تصمیماتی اخذ می شد که بسیاری برای اولین بار در ایران بود.

پرسش اول این بود برای ارائه بهترین خدمت به بیماران چه باید کرد؟

طبیبانه درمان کردن بیماران بدون بسط و گسترس دانش پزشکی امکان پذیر نیست، پس ناگزیر بودیم از پژوهش.

سنگ بنای "مرکز تحقیقات مدولاسیون عصبی و درد" بعنوان مرکزی بر پایه اندیشه‌ای درمان طبیبانه بنا نهاده شد و حالا با گذشت چند سال درستی آن اندیشه و راه آشکارتر شده است .

اصول ما در کار مرکز آن بوده که پیش از انجام هر کاری باید دوبار فکر کرد: اول در محاسن و معایب انجام فعل، همانگونه که در دانشگاه ها و مراکز تحقیقات دولتی آموخته بودیم و دوم در محاسن و معایب عدم انجام آن کار، چیزی که در ساختارهای گذشته ندیده بودیم و دلیل آن درک درست از محدودیت منابع بخصوص زمان و تعهد ما به رعایت اولویت های واقعی جامعه است.

آموزش را بر مبنای مدلهای معمول و رایج در جهان با تاکید بر آموزش مساله محور ترکیب می کنیم و به حلاوت کنجکاوی و پژوهش شیرین می کنیم و این راه ما را به ایده اکادمی تخصصی نیکان یا "آکادمی آتن" در کنار مرکز تحقیقات رساند که خوشبختانه یک سال بعد از مرکز تحقیقات افتتاح شد. خوشبختانه انتشار آثار و بروز

خروجی های مرکز تحقیقات همکاران عزیزی را در کنار ما قرار داد. همکاران دانشمند و دانشور ما در کلینیک درد نـاب، بـرای تقویـت پژوهشـهای حـوزه درد و در نهایـت کاهش آلام بیماران به مجموعه مرکز تحقیقات پیوستند و برنامه های متعدد آموزشی، پژوهشی را آغاز نمودند. برای کاهش درد و رنج بیماران خود را مقید می دانیم که بـه جدیدترین روش و ابزار تجهیز باشیم در حالیکه می دانیم وضعیت اقتصادی، بعضی از بیماران را نیز مانند خود ما از دسترسی به آخرین وسـایل و تجهیـزات مـورد نیـاز در پژوهش محروم می کند اما برای این مشکل هم راه حلی باید اندیشـید. از سـویی بـا سرمایه گذاری خطر پذیر در تحقیق و توسـعه و اعطـای گرنـت بـه دانـش پژوهـان و فناوران، امیدوار به ساخت نمونه های بهینه و البته ارزان تری از ابزارهای مدولاسـیون عصبی و کاهنده درد هستیم و از سوی دیگر از اندوخته مالی اندکی که حاصل تـلاش همکاران در مرکز است، با کمک دوستان در "بنیاد خیریه سلمان فارسی" برای تـامین هزینه درمان بیماران نیازمند استفاده می کنیم.

پژوهشهای پایه را برای درک و معرفت از آنچـه انجـام مـی دهـیم بـا عمـق بیشـتر و متفکرانه تر می بینیم ، پژوهشهای بالینی را با حفظ اصول اخلاقی و صرفا بـر مبنـای نیاز واقعی بیمار انجام می دهیم و توسعه ی فناوری را در راه عدالت در سـلامت بکـار میگیریم.

شاید معمول بود که در سالنامه بنویسیم مرکز تحقیقات خصوصی مدولاسیون عصـبی و درد در همکاری تنگاتنگ دانشگاه های منتخـب بخصـوص دانشـگاه علـوم پزشـکی شیراز در یکسال اخیر ۳۸ مقاله بین المللی منتشر کرده است، ۶ پایان نامه را حمایت علمی و مالی کرده، ۲۵ سمینار علمی برگزار کرده و در کنار آن ۵۰۰۰ بیمار مبتلا به اختلال حرکتی و نیازمند درمان مدولاسیون عصبی را شناسایی کرده و ۲۰۰ بیمار را با جراحی کارگذاری الکترود عمقی مغز درمان کرده است.

ولی با افتخاراعلام می کنیم در یکسال گذشته برای تعدادی از بیماران الکترود کاملا رایگان تهیه کردیم و برای بسیاری هزینه های جراحی را رایگان نمودیم تا اعتقاد و تعهد خود را به هدف غایی مراکز تحقیقاتی که خدمت به مردم است، نشان داده باشیم.

مانند گذشته دست همکاران دانشمند خود را می فشاریم و بر قدوم دانشجویان دیدگان خود را فرش راه می کنیم.

باش تا صبح دولتت بدمد

کاین هنوز از نتایج سحر است

دکتر علیرضا مهدی زاده

درباره ی ما

عمل جراحی تحریک عمقی مغز DBS بر روی بیماران مبتلا به پارکینسون برای نخستین بار در سال ۱۳۹۳ در شیراز، قطب پزشکی جنوب ایران، انجام شد. سایر اعمال جراحی تهاجمی و کم تهاجمی مدولاسیون عصبی شامل تحریک طناب نخاعی SCS در درمان درد، تحریک عصب خاجی SNM در درمان بی اختیاری، تحریک عصب واگ VNS در درمان تشنج، و کارگذاری پمپهای کاشتنی نخاعی بلافاصله در سالهای بعد، و مهمتر از همه تحریک عمقی مغز در درمان وسواس جبری توسط همین تیم جراحی انجام پذیرفت. انجام بیش از صد مورد از عمل های جراحی استریوتاکسی بر روی بیمارانی با مشکلات مختلف اعم از پارکینسون، دیستونی، انواع مختلف لرزش و همچنین وسواس ما را بر آن داشت که با بهره گیری از تیمی مجرب، به انجام پژوهش در جنبه های مختلف اعال جراحی فانکشنال و مدولاسیون عصبی بپردازیم و بررسی ایده های مفید در جهت افزایش بهبودی بیاران پس از عمل را نیز از اولویت های کاری خود بدانیم. در این راستا، ایده ی تاسیس یک مرکز تحقیقاتی خصوصی که به صورت خاص به پژوهشهای مرتبط در این خصوص بپردازد، در ذهن تیم درمانی ما ایجاد شد. این مرکز فعالیت خود را از سال ۱۳۹۷ در شیراز آغاز نمود و در سال ۱۳۹۸ موفق شد موافقت اصولی وزارت محترم بهداشت را دریافت نماید. در تابستان ۱۴۰۰ به عنوان نخستین و تنها مرکز تحقیقات خصوصی شیراز و جنوب کشور، مورد بازدید معاونت محترم پژوهشی و

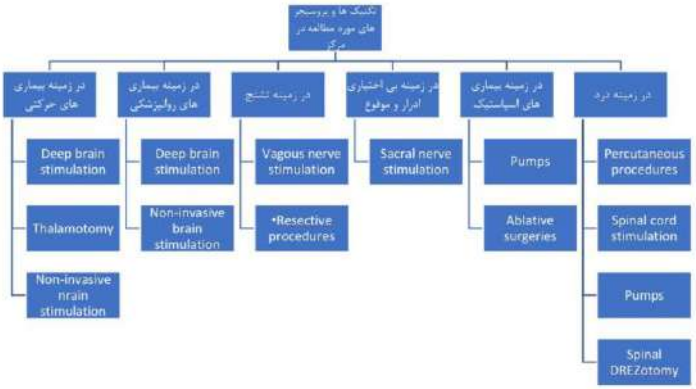
شورای عالی پژوهشی دانشگاه قرار گرفت و هم اکنون به عنوان مرکز تحقیقات خصوصی باحمایت معنوی دانشگاه به ادامه فعالیت می پردازد .چاپ بیش از ۳۷ مقاله در نشریات معتبر بین المللی از زمان شروع فعالیت تاکنون، ۶عنوان پایان نامه، ۳ فصل در کتاب معتبر نورومدولاسیون و همکاری با بیش از ده مرکز تحقیقات ملی و بین‌المللی از جمله دستاوردهای مرکز می باشد.

درباره مدولاسیون عصبی

مفهوم کلمه مدولاسیون در زبان فارسی، (ایجاد تغییرات در جهت بهبود) است و مدولاسیون عصبی یا نورومدولاسیون هم متعاقبا به معنای ایجاد تغییرات در سیستم عصبی به منظور بهبود شرایط خواهد بود. پیشینه ی نورومدولاسیون را باید در قرن های قبل از میلاد مسیح جستجو کرد؛ جایی که مصریان باستان از ماهی های رود نیل(ماهی تورپدو) که قادر به ایجاد حدود ۲۰۰ ولت الکتریسیته بودند برای کم کردن علائم افراد مبتلا به صرع استفاده می کردند. رومیان باستان از این روش حتی در درمان نقرس نیز استفاده میکردند و جالب تر آنکه برخی قبایل بومی آفریقایی هنوز هم این پروسه را دنبال می کنند. شاید بتوان اولین استفاده درمانی از تحریکات الکتریکی که با داشتن علم نسبی در این زمینه همراه بوده را به کریستین کراتزین اشتاین نسبت داد که در قرن ۱۸ میلادی آزمایشاتی را انجام داده است. در ادامه ی راه، فریتش و هیتزیش در قرن ۱۹ دریافتند که تحریک کورتکس مغزی منجر به انقباض عضلات می شود، و سال بعد از این آزمایش، بارتلو این آزمایش را بر روی انسان انجام داد و به نتایج مشابهی دست یافت. آزمایشات این چنینی بسیاری در طول قرن های اخیر باعث تکامل و پیشرفت فیزیولوژی، نوروساینس، علوم مهندسی و همینطور تکنیک های جراحی؛ در شکل گیری نورومدولاسیون در قالب امروزی بسیار موثر بوده اند. شاید در

نگاه اول حیطه ی مدولاسیون عصبی حیطه ای پر زرق و برق با مخارج و هزینه های بالا به نظر بیاید اما بشر با علم به اثرات درمانی و کاهش کلی هزینه ها سعی در گسترش و کاربردی تر کردن این زمینه ی درمانی داشته است. پیشرفتها و جایگاه امروزی مدولاسیون عصبی بدون سال ها تلاش، تحقیق و مخارج سنگین حاصل نشده است و فراوانی مقالات، کتب و کنفرانس هایی که سالانه در این باره در سراسر جهان برگزار می شوند موید این موضوع است. به طور مثال در سال ۲۰۱۰ چیزی حدود ۳ تا ۵/۴ میلیارد دلار در سطح جهان صرف هزینه ی تحقیق، درباره مدولاسیون عصبی توسعه و مصارف درمانی نورومدولاسیون شده است که در نگاه اول مبلغ گزافی به نظر میرسد که حتی شاید منجر به نتایج مطلوبی نشده باشد؛ اما اگر بدانیم که طبق برآورد ها در همان سال، نتیجه ی یکسان در درمان بیماران نیازمند، از طریق دارو درمانی و نه مدولاسیون عصبی مبلغی حدود ۲۰ میلیارد دلار مخارج به دنبال داشت نظر و ذهنیت خود را از این حیطه تغییر می دهیم.

این مرکز مفتخر است که بیش از در نوع پرو سیجر مختلف را در زمینه های درد و نوروماودولا سیون به انجام میر ساند.
شرح دقیق این مداخلات در فلوچارت زیر قابل ملاحظه است.



اعضای مرکز مدولاسیون عصبی و درد

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دکتر نیما درخشان
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دکتر محمد رادمهر
فوق تخصص درد

دکتر علی اصغر کریمی
متخصص داخلی
مدیر مرکز تحقیقات

دکتر راضیه رضایی
متخصص مغز و اعصاب فلوشیپ اختلالات حرکتی

دکتر پوریا استاد
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روانپزشک

دکتر آیدین امیدوار
جراح مغز و اعصاب

دکتر غلامرضا ودیعی
دستیار تخصصی جراحی مغز و اعصاب

سعید عبداللهی فرد
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سارا مقصود زاده
کارشناس ارشد روانشناسی

فاطمه خادمی اردکانی
کارشناسی ارشد مهندسی پزشکی
مدیر مرکز

اخذ موافقت اصولی مرکز تحقیقات خصوصی مدولاسیون عصبی از وزارت محترم بهداشت در سال ۱۳۹۸

جمهوری اسلامی ایران
وزارت بهداشت، درمان و آموزش پزشکی

سماره ۵/۵۰۰/۲۳۱۲
تاریخ ۱۳۹۸/۰۴/۲۳
پیوست ..دارد.....

دفتر وزیر
تاریخ: ۱۳۹۸/۰۴/۲۳

جناب آقای دکتر بهادر

رئیس محترم دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شیراز

با سلام و تحیات؛

به استناد رای صادره در دویست و هفتاد و دومین جلسه شورای گسترش دانشگاه های علوم پزشکی، مورخ ۱۳۹۸/۲/۲۹ با تاسیس مرکز تحقیقات نورومدولاسیون شرکت سیما سلامت نواندیشان (خصوصی) تحت نظارت دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شیراز موافقت اصولی بعمل آمد.

دکتر سعید نمکی
وزیر

دکتر قدیر بیاتی

معاون محترم رئیس جمهور و رئیس سازمان برنامه و بودجه کشور جهت استحضار و دستور اقدام لازم
معاون محترم رئیس جمهور و رئیس سازمان اداری و استخدامی کشور جهت استحضار و دستور اقدام لازم
معاون محترم ..... براي استحضار و دستور اقدام لازم
مشاور و مدیر کل محترم حوزه وزارتی جهت استحضار
معاونت محترم تحقیقات وفناوري جهت استحضار ودستور اقدام لازم
رئیس محترم مرکز توسعه مدیریت و تحول اداري جهت استحضار و دستور اقدام لازم
دبیر محترم شوراي گسترش دانشگاه‌هاي علوم پزشکی جهت استحضار و دستور اقدام لازم

نشانی پستی: تهران-شهرک قدس (غرب)-بین فلامک جنوبی و زرافشان-خیابان سیمای ایران-ستاد مرکزی وزارت بهداشت، درمان و آموزش پزشکی
تلفنهای تماس: ۸۱۹۵۵۲۰۱ نمابر: ۸۸۳۶۴۱۱۱ نشانی صفحه اینترنتی: http://www.behdasht.gov.ir

نظر چهره های مشهور مدولاسیون عصبی دنیا در خصوص مرکز

پروفسور Joachim Krauss

رئیس سابق جامعه جهانی جراحی اعصاب فانکشـنال و اسـتریوتاکتیک بابت راه اندازی جراحی اخـتلالات حرکتـی در جنـوب ایـران بـه شـما تبریک می گویم. موفقیت بسیار بزرگی است.

پرفسور Hans Speelman

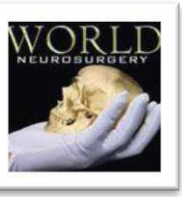
تبریک به نتایج DBS در شیراز ، اثبات کیفیت و استقامت تیم

Congratulations for the results of DBS in Shiraz: A proof of the quality and endurance of the team.

پروفسور Ludvic Zrinzo

موسسـه نورولـوژی UCL Queen Square لنـدن ایـن واقعـا یـک دستاورد فوق العاده است. نتایج شگفت انگیز عمل جراحی و مهمتر از آ ن ، سخت کوشی مثال زدنی تیم شما برای اطمینان هرچه بیشتر از در دسترس بودن این روش برای شهروندان ایرانی

HUGE congratulations! This is indeed a fantastic achievement. Wonderful results and, more importantly, amazing tenacity to ensure the procedure is available to as many Iranian citizens as possible.



مجله World Neurosurgery

این گروه موفق به راه اندازی یک مرکز درجه یک صرفا در کمتر از چند سال شده است

I commend the authors for their hard work establishing this DBS program and taking the time and energy to do research in this regard. They have established a center offering top notch care within just a few years.

مراکز همکار

دانشگاه علوم پزشکی شهید صدوقی یزد

بیمارستان بهمن گروه روانپزشکی

دانشگاه علوم پزشکی یزد

دانشگاه علوم پزشکی شیراز

کلینیک دردناب
Nab Pain Clinic

کلینیـــک فـوق تخصصـــی دردنـــاب

CENTRE HOSPITALIER
Henri Laborit

مرکز تحقیقات پیر دونیکه،فرانسه

تحقیقات در حوزه روانپزشکی

موسسه فناوری سلامت نیکان شریف
ATEN ACADEMY
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موسسه فناوری سلامت نیکان شریف

مرکز مهندسی پزشکی شیراز

ثبت بیماری ها و پیامدهای سلامت
Disease Registry & Health Outcomes

دبیرخانه ثبت بیماریها و پیامدهای سلامت

دانشگاه علوم پزشکی ارومیه

مرکز تحقیقات

جراحی مغز و اعصاب عملکردی

GMJ
Galen Medical Journal

مجله بین المللی پزشکی گالن

مرکز تحقیقات روانپزشکی

دانشگاه علوم پزشکی شیراز

محورهای اصلی فعالیت مرکز

۱. خدمات درمانی اعمال جراحی فوق پیشرفته مدولاسیون عصبی اختلالات حرکتی، وسواس جبری، تشنج، درد و بی اختیاری ادرار
۲. آموزش تخصصی ایجاد فرصت جهت متخصصین مغز و اعصاب و جراحان مغز و اعصاب جهت یادگیری در زمینه مدولاسیون عصبی
۳. آموزش پژوهش آموزش اصول پژوهش به پژوهشگران جوان در جهت اهداف مرکز
۴. آموزش عمومی آموزش به جامعه در جهت افزایش آگاهی و پیشگیری از بیماری های عصبی
۵. پژوهش های بالینی طراحی، مدیریت و انجام پژوهش های بالینی جهت پایش و بهبود کیفیت درمان
۶. پژوهش های بنیادی طراحی، مدیریت و انجام پروژه های بنیادی و مهندسی در جهت بومی سازی تکنولوژی مدولاسیون عصبی

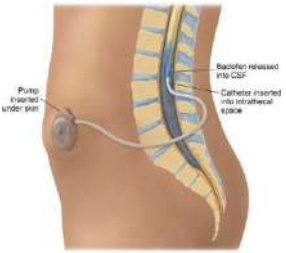
خدمات درمانی

درمان عمل جراحی تحریک عمقی مغز

درمان بیماری هـای پارکینسـون، دیسـتونی، لـرزش و برخی اختلالات روانپزشکی همچون اخـتلال وسـواس جبری توسط این تکنیـک جراحـی امکـان پـذیر مـی باشد.

عمل جراحی کارگذاری محرک نخاع

این عمل جراحی جهت بیمارانی که قـبلا تحـت عمـل جراحی ستون فقرات قرار گرفتـه انـد و مبـتلا بـه درد شدید سوزشـی در انـدامها مـی باشـند، و یـا بیمـاران دیابتی با چنین دردی مفید می باشد

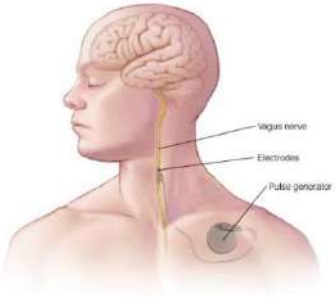


کارگذاری پمپ های نخاعی

جهت تزریق مورفین یا باکلوفن بیماران مبـتلا بـه درد شدید اندامهای بدن، خصوصـا بـه دنبـال بـدخیمی یـا آسیبهای نخاعی کاندید مناسبی برای کارگـذاری ایـن تکنولوژی پیشرفته هستند.

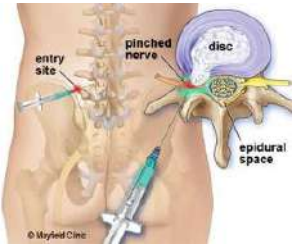
کارگذاری محرک عصب خاجی

در درمان بی اختیاری ادرار و مدفوع بیمارانی که به علل متعدد دچار اختلال نسبی کنترل ادرار و مدفوع می باشند، می توانند تحت عمل جراحی کارگذاری این دستگاه قرار گیرند.



اعمال جراحی جهت صرع

برخی از بیمارانی که علیرغم مصرف داروهای تشنج، بهبود کامل نیافته اند، می توانند طی پیشرفته ترین اعمال جراحی مغز و اعصاب، به صورت نسبی یا کامل بهبود یابند



درمان های کم تهاجمی درد

بیمارانی که دچار درد شدید صورت، کمر و یا گردن با یا بدون انتشار به اندامها می باشند و به درمانهای محافظه کارانه پاسخ ندهند، می توانند از پیشرفته ترین درمانهای کم تهاجمی درد بهره جویند.

آموزش تخصصی و آموزش پژوهش

مرکز مدولاسیون عصبی و درد از ابتدای تاسیس تا کنون، آموزش تحقیق و همچنین تعلیم افراد علاقه مند در حیطه ی مدولاسیون عصبی را جز اهداف خود دانسته و از این رو تا کنون با برگزاری کنفرانس های علمی، سعی در تعلیم پژوهشگران علاقمند داشته است.

در هر یک از جلسات این کنفرانس های علمی یکی از ابعاد نورومدولاسیون ارائه شدند و علاقمندان به این حیطه در این کنفرانس ها شرکت کرده اند .مباحث مطرح شده در این کنفرانس ها، تا کنون زمینه های مطرح شدن وادامه یافن بسیاری ازطرح های پژوهشی مرکز شده اند.


چگونه پژوهشگر شویم (1)
مدرس:
دکتر علی اصغر کریمی
• متخصص داخلی
• مخترع و پژوهشگر برتر
• سردبیر مجله گالن
دوشنبه
11 مردادماه
ساعت
9 الی 13
سرفصل های کارگاه:
- How to find the exploratory question?
- Literature review
- Type of studies
برای ثبت نام و اطلاعات بیشتر به لینک زیر مراجعه فرمایید
مکان: شیراز، خیابان معمار غربی، مجتمع پزشکی تابا، طبقه دوم


ICAHT
2021
اولین کنگره بین المللی
فناوری های پیشرفته در حوزه سلامت
و کاربرد هوش مصنوعی در پزشکی
محورهای همایش:
تاریخهای مهم:
ارسال مقالات
۱۴۰۰/۰۹/۰۷
اعلام نتایج داوری
۱۴۰۰/۰۹/۱۵
ارسال مقالات نهایی و
ثبت نام ۱۴۰۰/۰۹/۱۸
کنگره
۱۴۰۰/۱۰/۰۷ و ۱۴۰۰/۱۰/۰۸
برگزارکنندگان: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چگونه پژوهشگر شویم(۲)
سرفصل های کارگاه:
• آشنایی با پورپال نویسی
• قسمتهای مختلف یک پورپال
• اخلاق پزشکی
دو و3
شهریور
۴سکانس 1 ساعته
از 9 الی 18
مدرس:
دکتر علی اصغر کریمی
• متخصص داخلی
• مخترع و پژوهشگر برتر
• سردبیر مجله گالن
به علت شیوع
کرونا و درخواست
مکرر داوطلبان این
کارگاه مجازی
برگزار خواهد شد
برای ثبت نام و اطلاعات بیشتر به شماره زیر در واتساپ پیام بدهید
09045407676


مدرسه زمستانه :
ثبت ، تحلیل و پردازش EEG
Winter School on :
Electroencephalogram
سرفصل ها :
با رویکرد هوش مصنوعی در پزشکی


NeuroMaPC
جراحی روان در درمان افسردگی
Psychosurgery in major depressive disorder
دکتر آیدین امیدوار
پنجشنبه 1 اردیبهشت ساعت 19
ثبت نام از طریق ایوند
evand


اولین رویداد مجازی رباتیک (۱۴۰۰)
با محوریت موضوعات رباتیک
۱۹ الی ۲۰ فروردین
۱۴۰۰
۱۹:۰۰ - ۲۲:۰۰
سخنرانان (موضوعات)
برگزارکننده
ثبت نام و اطلاعات بیشتر
گواهی پایان دوره
حامیان
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پانزدهمین کنفرانس علمی مجازی
مرکز تحقیقات مدولاسیون عصبی و درد
الکترودهای کاشتنی عصبی بر پایه ساختارهای کربن
دکتر مریم حجازی
چهارشنبه ۱۵ بهمن ساعت ۱۹
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سیزدهمین کنفرانس علمی مجازی
مرکز تحقیقات مدولاسیون عصبی و درد
تاریخچه و سیر تحولات جراحی روان
تاریخ ۳ دی ساعت ۱۹
دکتر علی رزم گین
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چهاردهمین کنفرانس علمی مجازی
مرکز تحقیقات مدولاسیون عصبی و درد
دیستونی
تاریخ: ۲۴ دی ساعت ۱۹
دکتر رانیه رضایی
متخصص مغز و اعصاب
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دوازدهمین کنفرانس علمی مجازی
مرکز تحقیقات مدولاسیون عصبی و درد
سکته مغزی، درمان ها و چالش ها
تاریخ ۱۳ آذر ساعت ۱۹
دکتر نیلوفر نوشاد
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یازدهمین کنفرانس علمی (مجازی)
مرکز تحقیقات مدولاسیون عصبی و درد
وسواس، از مغز تا بالین
دکتر آیدین امیدوار
ثبت نام
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۱۴ آبان ساعت ۱۹
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پارکینسون
از سلول تا بالین
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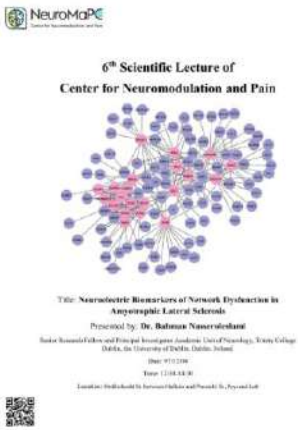
NeuroMaPC
6th Scientific Lecture of
Center for Neuromodulation and Pain
Title: Neuroelectric Biomarkers of Network Dysfunction in Amyotrophic Lateral Sclerosis
Presented by: Dr. Bahman Nasseroleslami


NEUROMODULATION
مدولاسیون عصبی
زمان
دوشنبه ۲۸ بهمن ماه ساعت ۱۵
مکان
خیابان زند، ساختمان بقراط، طبقه ۴
مرکز مدولاسیون عصبی و درد
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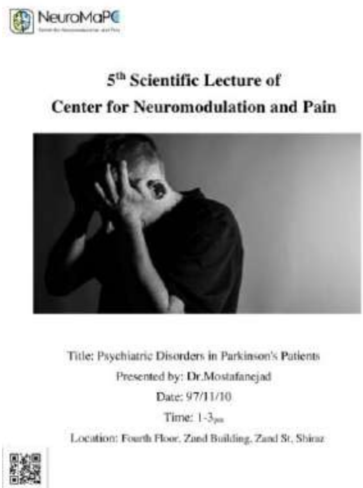
نوروآناتومی عملکردی: از حرکت تا شناخت


NeuroMaPC
5th Scientific Lecture of
Center for Neuromodulation and Pain
Title: Psychiatric Disorders in Parkinson's Patients
Presented by: Dr.Mostafanejad
Date: 97/11/10
Time: 1-3pm
Location: Fourth Floor, Zand Building, Zand St, Shiraz


مرکز نورومدولاسیون عصبی و درد برگزار می کند:
NeuroMaPC
DEEP BRAIN
STIMULATION
اصول تحریک عمقی مغز برای پژوهشگران
زمان
۱۸ دی ساعت ۱۷
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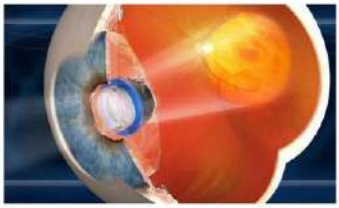
4th Scientific Lecture of
Center for Neuromodulation and Pain



Title: An Introduction to Neuroprosthetics with Focus on the Bionic Eye
Presented by: Dr.Bahman Tahayori
Date: 97/10/22
Time: 1-3pm
Location: Fourth Floor, Zand Building, Zand St, Shiraz

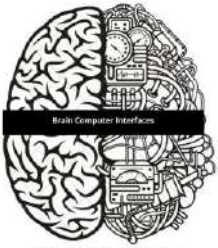
NeuroMaPC

3rd Scientific Lecture of
Center for Neuromodulation and Pain

Title: Electromagnetic Field Effects on Neuromodulation and Pain Control
Presented by: Dr.Alireza Mehdizadeh
Date: 97/10/05
Location: Fourth Floor, Zand Building, Zand St, Shiraz

NeuroMaPC

2nd Scientific Lecture of
Center for Neuromodulation and Pain



Title: Brain- Computer Interference
Presented by: Dr.Fariborz Ghaffarpasand
Date: 97/09/17
Location: Fourth Floor, Zand Building, Zand St, Shiraz

NeuroMaPC

1st Scientific Lecture of
Center for Neuromodulation and Pain

Title: Gait Analysis
Presented by: Dr.Behdad Tahayori
Date: 97/09/03
Location: Fourth Floor, Zand Building, Zand St, Shiraz

پایان نامه ها

پایان نامه های انجام شده با حمایت مرکز

دکتر نژلا مصطفی نژاد

دکتر امید یوسفی

فریده مؤمنی

پایان نامه های در دست انجام

دکتر سمانه خضرایی

محمد حسین محمدی

دکتر لیلا کلهر

آموزش های عمومی

.یکی دیگر از اهداف ۶ گانه ی این مرکز، آموزش برای عموم جامعه میباشد. بالا بردن اطلاعات جامعه در مورد بیماری های مختلف از جمله پارکینسون، به تشخیص بهتر و سیع تر بیماری و کمک به افراد مبتلا، کمک شایانی میکند. در کنار تلاش مستمر در آموزش تخصصی به پژوهشگران، متخصصین و دانشجویان رشته های مرتبط، تلاش در جهت ارتقاء دانش عمومی جامعه در خصوص بیماریهای هدف مدولاسیون عصبی از جمله اختلالات حرکتی و روانی، از مهمترین اهداف مرکز تحقیقات مدولاسیون عصبی و درد میباشد. در این راستا و علاوه بر برگزاری همایش سالیانه روز جهانی پارکینسون با حضور پزشکان و بیماران، تارنمای مرکز تحقیقات به آدرس neuromapc.com و حساب اینستاگرام neuromapc حاوی اطلاعات چندرسانه‌ای آموزشی جذاب به زبان ساده در خصوص موارد ذکر شده میباشد.


NeuroMaPC
مرکـــز مدولاسیـــون عصبی و درد
منسوب وزارت بهداشت، درمان و آموزش پزشکی
دکتر علی رزم کن
جراح مغز و اعصاب
رئیس مرکز تحقیقات مدولاسیون عصبی و درد
دکتر اشکان مولا
متخصص مغز و اعصاب
دانشگاه کالیفرنیای جنوبی
دکتر محمدرضا قینی
متخصص مغز و اعصاب
رئیس سابق انجمن سکته مغزی ایران
سکته مغزی
لایو اینستاگرام : شنبه ۱۰ آبان ساعت ۱۰ شب به وقت ایران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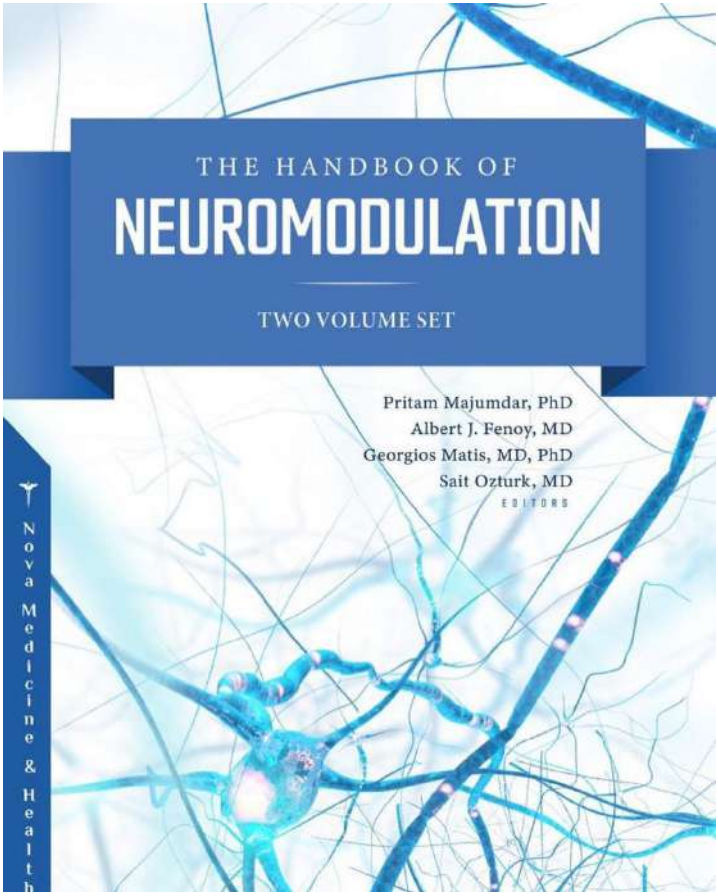

Chapter 19

Deep Brain Stimulation for Obsessive Compulsive Disorder

Ali Razmkon[1,2,*], Saeed Abdollahifard[1,2], Erfan Taherifard[1,3] and Hirad Rezaei[1,4]

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Abstract

OCD is a common psychiatric disorder represented by a diverse group of symptoms, including constant or recurring intrusive anxiety-generating thoughts, which is known as obsession associated with some compulsive ritualistic, repetitive behavior (Association, 2013; Sadock, 2015). To reduce the anxiety associated with obsession, the patient feels driven into a specific compulsive act, but it does not help all the times and may even worsen the pre-existing anxiety (Sadock, 2015). These obsessions and compulsions can be so time-consuming as to interfere with a patient's social life and activities (Sadock, 2015).

According to DSM-V diagnostic criteria for OCD, the patient should have time-consuming (more than 1 hour per day or interfering with normal functioning) obsessions or compulsions or both of them which are and not attributable to another medical condition or substance abuse and defined as below:

Obsessions are defined as constant or recurring intrusive thoughts or urge that mostly cause anxiety or distress, and the patient attempts to ignore or neutralize them with some other thoughts or by performing a specific action. Compulsions are repetitive behaviors or mental acts that, because of obsessions patient feels compelled to perform. These behaviors are aimed to reduce the patient's anxiety basis upon an unrealistic connection, and most of the time, even worsen it (Association, 2013).

The lifetime prevalence of OCD has been estimated to be 2 to 3 percentage in the general population. This estimation has placed OCD as the fourth most common psychiatric diagnosis (Sadock, 2015).

The conventional therapeutic approach to OCD is based on medical and psychological therapies. Although combination therapy of SSRIs and ERP is useful in many patients, 40-60% of patients experience persistent symptoms, and about 20% of them are refractory to these conventional treatments (Hezel & Simpson, 2019; Hirschtritt, Bloch, & Mathews, 2017; Kim et al., 2011). In addition to the disturbance in their everyday social life, these

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Chapter 20

Deep Brain Stimulation for Depression

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Abstract

Ancient Greek used the term *melancholia* instead of depression. Melancholia consists of 2 parts —*melas* means black and *khole is* translated as bile; thus, melancholia means black bile. It comes from Ancient Greeks' belief indicating that the healthy body depends on the balance of 4 fluids and hormones—blood, yellow bile, dark bile, and phlegm (Karst, Friedman and Katz 1974, Jackson 1986). In *melancholia*, the balance of these 4 fluids is disturbed. A patient suffering from Melancholia developed particular mental and physical symptoms, as explained by Hippocrates in his book, *Aphorphous* (Jackson 1986). Persian physicians extended the definition of Avicenna defined melancholia in his book, The Canon of Medicine, as a state of depressed mood (Haque 2004, TABEI, DR et al., 2004). In addition, he evaluated the relationship between depressive mood and several diseases. In the Canon of Medicine, he illustrated several treatments for depression such as herbal Persian medicine as antidepressants, aromatherapy, and music therapy (Khodaei, Noorbala et al., 2017).

In the 17th century, Robert Burton in '*The Anatomy of Melancholy*' illustrated that melancholia could affect different aspects of the patients' daily life such as sleep and social activities (Burton 1912).

Emil Kraepelin, a German psychologist, for the first time used the term depression which has been extracted from the Latin word 'deprimere' and defined it as a decrease in mood. In addition, he described different types of melancholia in various decades of life, for instance, involuntary melancholia in adulthood (Davison 2006). In 1860, a French psychiatrist, Louis Delasiauve, reported specific symptoms of depression (Berrios 1988).

Introduction

Major depressive disorder (MDD) is a rife psychiatric disease that is categorized as a mood disorder. In MDD, the patients experience at least 5 out of 9 symptoms: depressed mood, decreased energy, psychomotor retardation, diminished daily activity level, appetite variation,

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Chapter 22

Deep Brain Stimulation for Alzheimer's Disease

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Abstract

Alzheimer's disease (AD) is the most common type of dementia and as an age-related disease is increasing in prevalence as life expectancy has raised worldwide. In 2016 there were about 43.8 million individuals affected by dementia. This figure has more than doubled in the last 30 years (Nichols et al., 2019) and it is estimated that by the year 2050, one in every 85 persons will be affected by AD (Brookmeyer, Johnson, Ziegler-Graham, and Arrighi, 2007). Dementia is tremendously debilitating for affected individuals and places a huge burden on their families and caregivers. Alzheimer's disease has been known for a long time and scientific efforts to understand disease pathophysiology have been massive. Pathological hallmarks of the disease are accumulation of amyloid-β peptide in extracellular space, presence of intracellular tangles of the protein tau, and also neuritic plaques formation (Thakur, Kamboj, Goswami, and Ahuja, 2018). Neuronal cell degeneration in AD is widely distributed in the brain and is seen particularly in the hippocampus, entorhinal cortex, amygdala, deep subcortical nuclei such as the cholinergic basal nuclei, serotonergic dorsal raphe, and noradrenergic locus coeruleus. Moreover, their cortical association regions of the frontal, temporal and parietal cortices are shown to be affected (Kumar and Singh, 2015). The cholinergic hypothesis of AD is among the oldest explanations of disease pathophysiology. The key points of physiological abnormalities in AD are the expression of cholinergic receptors, acetylcholine release, and choline transport. Cholinesterase inhibitors are among the AD treatment front line (Blake, Terry, Plagenhoef, Constantinidis, and Liu, 2017).

Even though amyloid-β accumulation is a hallmark of the disease and several therapeutic strategies such as promoting amyloid clearance, preventing amyloid aggregation, amyloid based immunotherapy, and modulation of secretase enzyme were available but none were successful in demonstrating efficacy to cure or reverse the disease in clinical trials (Anand, Gill, and Mahdi, 2014).

The network disturbance hypothesis is also an important debate in the understanding of AD pathophysiology. Fornix as a part of the Papez circuit is shown to have disease-

No	Title	Journal	Years	Index
۱	Effect of deep brain stimulation on freezing of gait in patients with Parkinson's disease: a systematic review	British Journal of Neurosurgery	۲۰۲۲	ISI, Scopus, PubMed, Embase
۲	Application of convolutional network models in detection of intracranial aneurysms: A systematic review and meta-analysis	Interventional Neuroradiology	۲۰۲۲	ISI, Scopus, PubMed, Embase
۳	Balloon-mounting stent for intracranial arterial stenosis: A comprehensive and comparative systematic review and meta-analysis	Interventional Neuroradiology	۲۰۲۲	ISI, Scopus, PubMed, Embase
۴	Cytomegalovirus coinfection in patients with severe acute respiratory syndrome coronavirus ۲ infection:	Infectious Diseases	۲۰۲۲	ISI, Scopus, PubMed, Embase
۵	The effect of deep brain stimulation in children with autism	Interdisciplinary Neurosurgery	۲۰۲۲	ESCI (ISI), Scopus, Embase, DOAJ

	spectrum disorder: A systematic review			
۶	Coil Embolization of a Pseudoaneurysm of the Petrous Internal Carotid Artery Presenting with Otorrhagia: A Case Report and Review of the Literature	Iranian Journal of Radiology	۲۰۲۱	ISI, Scopus, Embase
۷	Effect of deep brain stimulation on impulse control behaviors of Parkinson's disease patients: A systematic review and meta-analysis	Interdisciplinary Neurosurgery	۲۰۲۱	ESCI (ISI), Scopus, Embase, DOAJ
۸	Asymptomatic dural ectasia in neurofibromatosis-۱	Current Journal of Neurology	۲۰۲۱	ESCI (ISI), Scopus, PubMed, Embase, DOAJ
۹	Brain solutions for hearing problems during the COVID-۱۹ pandemic and the misery of wearing a mask	European Archives of Oto-Rhino-Laryngology	۲۰۲۱	ISI, Scopus, PubMed, Embase
۱۰	Effects of adhesion barrier gel on	Heliyon	۲۰۲۱	ESCI (ISI), Scopus,

	functional outcomes of patients with lumbar disc herniation surgery; A systematic review and meta-analysis of clinical trials			PubMed, DOAJ
۱۱	Results of Surgical Treatment in Patients with Intracranial Arachnoid Cyst During Last ۵ Years in a Referral Center in a Developing Country: Shiraz, Iran	World Neurosurgery	۲۰۲۱	ISI, Scopus, PubMed, Embase
۱۲	Vagal nerve stimulation for the treatment of male factor infertility.	Andrologia	۲۰۲۱	ISI, Scopus, PubMed, Embase
۱۳	Letter to the Editor Regarding" Split-Pons Syndrome by Epidermoid Cyst: A Case Report and Review of the Literature".	World Neurosurgery	۲۰۲۱	ISI, Scopus, PubMed, Embase
۱۴	Differentiating between low-and high-grade glioma tumors measuring apparent diffusion coefficient values in various regions of the brain	Oman Medical Journal	۲۰۲۱	Scopus, PubMed, DOAJ

۱۵	Synthesis, Characterization and MRI Application of Cobalt-Zinc Ferrite Nanoparticles Coated with DMSA: An In-vivo Study	Applied Magnetic Resonance	۲۰۲۱	ISI, Scopus
۱۶	Medical image registration using deep neural networks: a comprehensive review	Computers & Electrical Engineering	۲۰۲۰	**ISI, Scopus**
۱۷	In Reply to the Letter to the Editor Regarding" Intravenous Acetaminophen (Paracetamol) for Postcraniotomy Pain; Systematic Review and Meta-analysis of Randomized Clinical Trials"	World neurosurgery	۲۰۲۰	ISI, Scopus, PubMed, Embase
۱۸	Microsurgical training curriculum for neurosurgery residents in Southern Iran	Iranian Journal of Neurosurgery	۲۰۲۰	DOAJ
۱۹	Tranexamic Acid; A Glittering Player in the Field of Trauma	Bulletin of Emergency & Traum	۲۰۲۰	PubMed, Embase

۲۰	Intravenous acetaminophen (paracetamol) for postcraniotomy pain: systematic review and meta-analysis of randomized controlled trials	World neurosurgery	۲۰۲۰	SI, Scopus, PubMed, Embase
۲۱	MicroRNA-۱۹۹a Upregulation mediates lumbar intervertebral disc degeneration and is associated with clinical grades of degeneration	Turk Neurosurg	۲۰۲۰	ESCI (ISI), Scopus, Embase
۲۲	Review of Renal Biopsies, A Single Center Experience	Iranian Journal of Kidney Diseases	۲۰۲۰	ISI, Scopus, PubMed, Embase
۲۳	Using Preimplanted Deep Brain Stimulation Electrodes for Rescue Thalamotomy in a Case of Holmes Tremor: A Case Report and Review of the Literature	Stereotactic and Functional Neurosurgery	۲۰۲۰	ISI, Scopus, PubMed, Embase
۲۴	Risk Factors of Neural Tube Defects in a Sample of Iranian Population From Southern Iran: A Hospital-	Iranian Journal of Neurosurgery	۲۰۱۹	DOAJ

	based Investigation			
۲۵	Ventrolateral Preoptic Nucleus of Hypothalamus: A Possible Target for Deep Brain Stimulation for Treating Sexual Dysfunction	Iranian Journal of Neurosurgery	۲۰۱۹	DOAJ
۲۶	Older patients have better pain outcomes following microvascular decompression for trigeminal neuralgia	Neurosurgery	۲۰۱۹	ISI, Scopus, PubMed, Embase
۲۷	In Reply to" Noncoding Ribonucleic Acid Studies of Lumbar Disk Disease: Decade Retrospect"	World neurosurgery	۲۰۱۹	SI, Scopus, PubMed, Embase
۲۸	Determinants of reoperation after decompressive craniectomy in patients with traumatic brain injury: A comparative study	Clinical Neurology and Neurosurgery	۲۰۱۹	ISI, Scopus, PubMed, Embase
۲۹	MicroRNA expression profiles, target genes, and pathways in intervertebral disk degeneration: a	World neurosurgery	۲۰۱۹	SI, Scopus, PubMed, Embase

	meta-analysis of ۳ microarray studies			
۳۰	Clinical outcome of VY flap with latissimus dorsi and gluteal advancement for treatment of large thoracolumbar myelomeningocele defects: A comparative study	Journal of Neurosurgery: Pediatrics	۲۰۱۹	ISI, Scopus, PubMed, Embase
۳۱	Exercise induced operant conditioning of the H-reflex in stroke patients: Hopes for improving motor function through inducing plastic changes in the spinal pathways	J Neurol Sci Disord	۲۰۱۹	-
۳۲	Initial results of bilateral subthalamic nucleus stimulation for parkinson disease in a newly established center in a developing country: Shiraz, Southern Iran	World neurosurgery	۲۰۱۹	SI, Scopus, PubMed, Embase
۳۳	Effects of cerebrolysin on functional outcome of patients	Neuropsychiatric Disease and	۲۰۱۹	ISI, Scopus, PubMed, Embase, DOAJ

	with traumatic brain injury: a systematic review and meta-analysis	Treatment		
۳۴	Determination of miRNA-۱۹۹a and its Target Genes in Degenerative Lumbar Intervertebral Disc	-	۲۰۱۷	-
۳۵	Effect of deep brain stimulation on Parkinson's disease dementia: A systematic review and meta-analysis	Basic and Clinical Neuroscience	۲۰۱۷	ESCI (ISI), Scopus, PubMed, Embase
۳۶	Neurotrauma as an Evolving Indication for Neuromodulation	Bulletin of Emergency & Trauma	۲۰۱۷	PubMed, Embase

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REVIEW ARTICLE

Effect of deep brain stimulation on freezing of gait in patients with Parkinson's disease: a systematic review

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ABSTRACT

Background and objectives: Freezing of gait (FOG) is a disabling gait disorder in patients with Parkinson's disease (PD), characterized by recurrent episodes of halting steps. Dopaminergic drugs are common treatments for PD and FOG; however, these drugs may worsen FOG. Deep brain stimulation (DBS) is another option used to treat selected patients. The device needs to be programmed at a specific frequency, amplitude, and pulse width to achieve optimum effects for each patient. This systematic review aimed to evaluate the efficacy of DBS for FOG and its correlation with programmed parameters and the location of the electrodes in the brain.

Materials and methods: Data for this systematic review were gathered from five online databases: Medline (*via* PubMed), Scopus, Embase, Web of Science, and Cochrane Library (including both Cochrane Reviews and Cochrane Trials) with a broad search strategy. We included those articles that reported clinical trials and a specific measurement for FOG.

Results: This review included 13 studies of DBS that targeted the subthalamic nucleus (STN), substantia nigra (SNr), or pedunculopontine nucleus (PPN). Our analysis showed that low-frequency stimulation (LFS) was superior to high-frequency stimulation (HFS) for improving FOG. In the long term, the efficacy of both LFS and HFS decreased. The effect of amplitude was variable, and this parameter needed to be adjusted for each patient. Bilateral stimulation was better than unilateral stimulation.

Conclusion: DBS is a promising choice for the treatment of severe FOG in patients with PD. Bilateral, low-frequency stimulation combined with medical therapy is associated with better responses, especially in the first 2 years of treatment. However, individualizing the DBS parameters should be considered to optimize treatment response.

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Freezing of gait; FOG; deep brain stimulation; DBS; Parkinson's disease

Introduction

Freezing of gait (FOG) is a disabling gait disorder seen mainly in Parkinson's disease (PD). It is characterized by recurrent episodes of halting steps, each lasting for a few seconds. FOG is associated with a more severe course of PD and may lead to a more reduced quality of life and poorer outcomes in these patients.[1] It has also been shown that FOG can be considered an independent risk factor for falls and fractures.[2] FOG usually occurs in the off state, but on-state FOG is also seen occasionally.[3,4] Its prevalence increases over the course of the disease, and only 28% of cases occur in the first 5 years following disease diagnosis.[5] With a point prevalence of 27% and 12-year prevalence of 63%, FOG can cause increased morbidity in patients with PD.[6,7]

Dopaminergic drugs play a fundamental role in the treatment of PD and FOG; however, these drugs may also worsen FOG.[8] Deep brain stimulation (DBS) is another treatment option for carefully selected patients with PD.[9] The approach involves placing electrodes over predetermined target nuclei using stereotaxy, followed by electrical stimulation of these nuclei with a programmable implantable neurostimulator.[10] DBS can be either bilateral or unilateral.[11] programmed at high or low frequency,[12] and can modulate different targets in the brain, such as the subthalamic nucleus (STN), substantia nigra (SNr), or pedunculopontine nucleus (PPN).[13,14]

There are considerable differences in response to DBS treatment among different study groups. While some studies supported the effectiveness of this approach in treating FOG, others showed worsening of FOG after DBS. In a clinical trial with two arms, i.e. bilateral STN-DBS and continued best medical treatment, it was shown that participants in the intervention group had a statistically significantly reduced rate and severity of FOG at follow-up.[15] However, in a report by Fleury and colleagues, which was also conducted with a target in the brain, contrary results were seen and gait deteriorated in participants with DBS.[16] The occurrence of FOG was also demonstrated in other studies after DBS was used in patients without PD suffering from other movement disorders, such as generalized dystonia.[17,18] One could assume that these differences in the effect of DBS on the occurrence or severity of FOG may correlate with the patients' response to dopaminergic drugs;[19] however, it appears that the stimulation parameters and configuration including voltage, frequency, and electrode location

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Review Article

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Balloon-mounting stent for intracranial arterial stenosis: A comprehensive and comparative systematic review and meta-analysis

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Abstract

Introduction: As one of the major causes of acute ischemic stroke, intracranial arterial stenosis necessitates an intervention that ranges from medical treatment to balloon angioplasty and stenting. Self-expandable stents (SES) and balloon-mounted stents (BMS) are two types of stents and their comparative efficacy and safety for intracranial stenosis are not well established.

Methods: Studies that investigate balloon-mounted stenting for intracranial stenosis were extracted from PubMed, Scopus, and Cochrane library. We sought to gather data on the success rate, change in mean arterial stenosis, and complications such as minor and major stroke and death (MMD), symptomatic intracranial hemorrhage, myocardial infarction, all-cause mortality, and in-stent re-stenosis.

Results: 3049 patients from 35 studies were included in this study. 20 studies investigated BMS alone and others compared BMS with SES. BMS was significantly more effective in reducing the degree of stenosis compared to SES (Difference in mean −5.953, CI 95% −7.727 to −4.179), had less complications compared to SES such as MMD (8.5% vs. 11.2%) and less in-stent re-stenosis (18.6% vs. 19.6%), but patients with SES experienced a lower rate of all-cause mortality(1.7% vs. 4.1%).

Conclusion: Intracranial stenting with BMS is more effective in reducing the degree of stenosis and has lower rates of complications when compared to SES.

Keywords
Balloon-mounted stent, self-expandable stent, intracranial arterial stenosis

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Introduction

Acute Ischemic stroke (AIS) is one of the major causes of death and disability in adults.[1,2] Intracranial atherosclerotic arterial stenosis is one of the major causes of stroke in different races which necessitates an effective and safe treatment for revascularization and providing re-perfusion.[3] Best medical therapy (BMT), self-expandable stents (SES), balloon-mounted stents (BMS), and recently introduced drug eluted stents (DES) are among the methods used for management of intracranial stenosis and efficacy, and safety profile of each method are discussed in various reports.[4,5]

Clinical trials have previously showed high incidence of complications when SES used for the treatment of intracranial stenosis.[6,7] However, Weave trial, revealed that the overall complication rate of the SES is lower than what was thought previously.[8]

BMS was initially used for coronary artery interventions in the 1990s, and in recent years have been used increasingly by neuro-interventionalists for treatment of intracranial stenosis.[9] Due to the differences in the structure and placement techniques of BMS and SES, several studies have compared these two methods or have reported the safety profile of each method.[4,10]

In this systematic review and meta-analysis, we aimed to compare the efficacy and intra- and post-procedural

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REVIEW ARTICLE

Cytomegalovirus coinfection in patients with severe acute respiratory syndrome coronavirus 2 infection: a systematic review of reported cases

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ABSTRACT

Background: Dysfunction of both the innate and the adaptive immune systems is observed in severe coronavirus disease 2019 which, together with administration of immunosuppressive drugs, could lead to cytomegalovirus coinfection or reactivation associated with a poorer outcome. The current study aimed to systematically review the pattern, presentations, clinical course and outcome of patients with severe acute respiratory syndrome coronavirus 2 and cytomegalovirus coinfection.

Methods: Three online databases, PubMed, Scopus and Web of Science, were searched, and after excluding duplicates and irrelevant reports, eligible articles were identified. Information about patients' age and gender, comorbidities, presentations of coronavirus disease 2019 and cytomegalovirus, treatment courses and outcomes were extracted.

Results: A total of 34 reports with 59 patients with coinfection were considered to be eligible for data extraction. A majority of patients were middle-aged or elderly (84.5%). More than three-fourths (79.2%) had at least one comorbidity. Cytomegalovirus viremia was documented in 43 patients. The most common end organ involved was the gastrointestinal tract in 13 patients (48.1% of 27 patients with end organ involvement), mostly as cytomegalovirus colitis, followed by the respiratory tract in 12 patients. There was a significant association between intubation and fatal outcome ($p = .011$).

Conclusion: We comprehensively reviewed published cases with coronavirus disease 2019 and cytomegalovirus reactivation. The findings may assist in appraising signs and symptoms for early suspicion, detection and treatment in patients with unusual clinical courses or with severe, prolonged or unexplained deterioration of end organ function.

KEYWORDS
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Review Article

The effect of deep brain stimulation in children and adults with autism spectrum disorder: A systematic review

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ABSTRACT

Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental and pervasive developmental disorder characterized by major impairments in social communication and interaction, stereotyped and ritualistic behavior, and deficiency in sensory activity. Children and adults with ASD show deficit in several domains such as cognition, memory, attention, emotion recognition and regulation, and social skills. The aim of this study was to investigate the effects of Deep Brain Stimulation (DBS) on children and adults with autism spectrum disorder.

Methods: This study was a systematic review. PubMed, Scopus, Cochrane library and Web of sciences were searched using terms for ASD and DBS. Eleven studies were selected for review. These studies investigated the effect of deep brain stimulation in reducing symptoms of ASD.

Results: There have been 7 published articles about patients who underwent DBS for ASD accompanied by life threatening self-injurious behavior, not alleviated by antipsychotic medication. Also, 4 studies investigated autism-like behaviors. The target included the anterior limb of the internal capsule, globus pallidus internus, and basal latera nucleus of the amygdala. The patients' age ranged between 6 and 37 years.

Conclusion: Results of this systematic review showed that DBS might be effective for severe, medically refractory symptoms in children and adults with autism spectrum disorders. Current evidence showed that the number of symptoms such as repetitive and compulsive behavior, obsessive thought, aberrant behavior, and self-injurious behavior decreased after DBS. Further studies are suggested to be conducted on this topic.

1. Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental and pervasive developmental disorder characterized by major impairments in social communication and interaction, deficient in sensory activity, and stereotyped and ritualistic behavior [1]. The worldwide prevalence of ASD is 1%, and the incidence was estimated in some regions as high as 1 in 57 children [2]. According to the criteria of *Diagnostic and Statistical Manual of Mental Disorders 5th edition* (DSM-5), its prevalence has grown dramatically around the world and is reported as 1% in newborn children [1]. Males are disproportionally affected, with a male to female ratio reported as high as 3 to 1 [3]. Children and adults with ASD show deficits in several domains such as memory, attention, cognition, emotion recognition and regulation, and social skills [4]. Current consensus is that the key diagnostic features of ASD include 1) persistent deficits in social communications and socio-emotional interactions across multiple contexts, such as difficulty developing, maintaining, and understanding the relationships with others, and problems in verbal and non-verbal communication; 2) limited and repetitive interests such as insistence on environmental monotony, use of restricted, repetitive phrases, and obsessive behaviors; 3) abnormal feelings and strange and odd behaviors [3,5].

The etiology and pathology of ASD are not conclusively clear. Neuroimaging studies have reported abnormalities in the patterns of brain perfusion, regional brain volumes, excitatory/inhibitory neurotransmission and synaptic plasticity, and neural biochemical characteristics of ASD [1,6]. These abnormalities are not limited to a single brain region; rather, they are the result of breakdown in integrating and functioning of long-range neural circuits [1,2]. Some neurophysiological findings that may be underlying pathological cause of the symptom associated with ASD include large volumes of the right brain structures associated with social functions and language [1]. Hypoactivation of

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Accepted Manuscript (Uncorrected Proof)

Title: Effect of Deep Brain Stimulation on Parkinson's Disease Dementia: A Systematic Review and Meta-Analysis

Authors: Ali Razmkon[1, 2], Saeed Abdollahifard [1, 2*], Hirad Rezaei [1, 3], Amir Reza Bahadori[1, 3], Parham Eskandarzadeh[1,3], AmirAli Rastegar Kazerooni[1,3]

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Published online 2022 April 25. Case Report

Coil Embolization of a Pseudoaneurysm of the Petrous Internal Carotid Artery Presenting with Otorrhagia: A Case Report and Review of the Literature

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Abstract

Otorrhagia is not a common manifestation of petrous internal carotid artery (ICA) aneurysm. Besides idiopathic cases, different etiologies, including trauma, infection, and radiation, have been suggested for petrous ICA aneurysms/pseudoaneurysms. However, there is limited experience in the management of this rare aneurysm/pseudoaneurysm with coil embolization. A 58-year-old man, who was a known case of chronic otitis media, was referred from the otorhinolaryngology ward with intractable bleeding from the right ear. A pseudoaneurysmal lesion (7 mm × 5 mm) was detected in the petrous segment of the internal carotid artery. The patient underwent coil embolization with no complications. To the best of our knowledge, this is the first case of petrous ICA pseudoaneurysm, presenting with only intractable otorrhagia. The patient was successfully treated with coil embolization, with no need for further interventions. Besides, a review of petrous ICA aneurysms or pseudoaneurysms presenting with otorrhagia was performed.

Keywords: Interpetrosal Internal Carotid Artery Pseudoaneurysm, Coil Embolization, Endovascular Treatment, Otorrhagia

1. Introduction

Intractable otorrhagia, as a solitary symptom, is not a common manifestation of petrous internal carotid artery (ICA) aneurysms and pseudoaneurysms. Besides idiopathic cases, various etiologies, such as trauma, infection, and radiation, have been suggested for petrous ICA aneurysms. Secured by the petrous bone, these aneurysms are challenging targets for open surgery, making endovascular approaches an advantageous treatment for these cases (1, 2). Considering the variety of endovascular options, such as stenting and coil embolization, besides the rarity of this condition, herein, we report a case of petrous ICA pseudoaneurysm presenting with only otorrhagia, who was treated by coil embolization. Moreover, a review of petrous ICA aneurysms and pseudoaneurysms presenting with otorrhagia was conducted.

2. Case Presentation

A 58-year-old man, who was a known case of chronic otitis media, was referred from the otorhinolaryngology ward with intractable bleeding from the right ear. He had a history of tympanoplasty and mastoidectomy due to chronic otitis media 23 years ago. Although he never mentioned otorrhagia in his medical history, he had experienced severe hearing loss and episodes of otorrhea since the operation. After hemodynamic stabilization, a CT angiogram of the head and neck was requested for the patient, which was highly suspicious of a pseudoaneurysmal lesion of the right ICA. Considering the possible location of the ICA lesion, the patient underwent conventional angiography, which indicated a 7 × 5 mm pseudoaneurysm in the right petrous ICA and confirmed our previous findings.

Femoral artery access was replaced with a 7F vascu-

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Current Journal of Neurology

Letter to Editor

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Asymptomatic dural ectasia in neurofibromatosis-1: A case report

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Keywords
Neurofibromatosis; Dura Matter; Ectasia; Low Back Pain

Neurofibromatosis-1 (NF1) is a multisystem genetic disorder that affects approximately 1 in 3000 individuals, can be inherited in an autosomal dominant pattern, and can be developed with spontaneous mutations. As it can affect many organs, NF1 has various signs and symptoms from skin manifestation (such as cafe-au-lait spots or axillary/inguinal freckling) to neurobehavioral disorders (such as attention deficit hyperactivity disorder, or autism spectrum disorder). NF1 can also affect the musculoskeletal system, and develop conditions such as kyphoscoliosis, vertebral body scalloping, and dural ectasia.[1,2]

Dural ectasia, defined as the ballooning of the dural sac around the spinal cord, is mostly associated with Marfan syndrome, ankylosing spondylitis, Ehlers-Danlos syndrome, and NF1. Currently, there is no definite explanation about the pathophysiology of dural ectasia in these aforementioned conditions.[3]

A 21-year-old woman was referred to our center with moderate low back pain and an abnormal imaging study. She had no other complaints such as radicular pain or any motor or sensory deficits.

Although physical exam did not reveal any relevant neurological findings in the lower back and extremities, magnetic resonance imaging (MRI) demonstrated strange anomalies in the lumbar area involving L1-L4 vertebral bodies, including vertebral body scalloping and wedging. On further examination, we found axillary freckling and multiple different-size cafe-au-lait spots in her back. Moreover, a positive family history of neurofibromatosis was noted in her brother. Eventually, due to lack of significant symptoms or neurological deficits and an acceptable spinal curvature, no operative treatment was considered, and the patient responded satisfactorily to the conservative treatment (Figure 1, A and B).

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Review article

Effects of adhesion barrier gel on functional outcomes of patients with lumbar disc herniation surgery; A systematic review and meta-analysis of clinical trials

Seyedmorteza Hosseini [a], Amin Niakan [b], Maryam Dehghankhalili [c], Reza Dehdab [a], Shima Shahjouei [d], Yasamin Rekabdar [e], Elaheh Shaghaghian [f], Alireza Shaghaghian [g], Fariborz Ghaffarpasand [b,*]

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ABSTRACT

Failed Back Surgery Syndrome (FBSS) is persistent pain and disability following lumbar laminectomy which is associated with decreased quality of life and disability and has been reported in up to 40% of the patients undergoing lumbar laminectomy. Several approaches have been introduced to reduce the rate of the FBSS. Among these, applying anti-adhesive barrier gels have been studied with interest with controversial results. The aim of the current study was to determine the effects of anti-adhesive barrier gels on functional outcome and recurrence of patients undergoing lumbar disc surgery. We searched databases including EMBASE, PUBMED, Web of Science, Scopus, Cochrane Library, and scholar databases until November 2019. To assess the heterogeneity across included studies we used Cochran's Q and I-square (I^2) statistics. Standardized mean difference (SMD) and 95% CI between were used to estimate pooled effect sizes. Out of 4567, 10 clinical trials found to be appropriate for current meta-analysis. The pooled results of included clinical trials indicated that adhesion barrier gel significantly decreased leg pain (LP) (SMD = −0.31; 95% CI, −0.60, −0.03; P = 0.032; I^2: 59.2%) among patients with lumbar disc herniation surgery. Back pain (BP) (SMD = −0.03; 95% CI, −0.23, 0.16; P = 0.734; I^2: 40.2%), and Oswestry disability index (ODI) (SMD = −0.11; 95% CI, −0.27, 0.05; P = 0.179; I^2: 0.0%), were not significantly affected following adhesion barrier gel application. Application of adhesion barrier gel in single level lumbar disc surgery is associated with decreased leg pain. However, its application does not affect the low back pain, disability and gait. Further, larger randomized clinical trials are required.

1. Introduction

Low back pain (LBP), is a major public health problem in both developed and developing countries which is associated with high social and economic burden with estimated worldwide prevalence of 22% in general population [1, 2]. More than half of the patients with LBP suffer from lumber intervertebral disc (IVD) pathologies and herniation which requires treatment [3, 4]. The treatment of the LBP and IVD-attributable pain, is based on the duration of symptoms, the clinical examination, neurological status and imaging findings and is consisted of life-style modifications, medical and physical therapies and finally surgery [5]. Although genetic factors play an important role in pathogenesis of LBP and IVD pathologies [6, 7], but the natural course of the disease remain elusive and requires interventions mostly [8, 9]. This places the spine surgical procedures and mostly the lumbar laminectomy among the most common procedures performed for treatment of the radiculopathy and LBP [3, 4]. The aim of the lumbar laminectomy is the decompression of the neural elements and restring the normal anatomical borders of the

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SHORT COMMUNICATION

Brain solutions for hearing problems during the COVID-19 pandemic and the misery of wearing a mask

Nima Derakhshan[1] · Shekoofeh Yaghmaei[2]

Received: 13 September 2020 / Accepted: 30 October 2020

Abstract

Background In COVID-19 pandemics days, wearing facial mask in public places has become obligatory to prevent the virus spread. In addition to its valuable protection, wearing facial mask can affect verbal communication in an adverse fashion and makes mutual understanding difficult. This happens because the mask eliminates the positive effect of the lip-reading phenomenon in direct communications. The mirror neuron system is responsible for automatic imitation, associative sequence learning, and motor mimicry. This system is a strong candidate justifying an unexpected action described in this article.

Purpose Taking the facial mask off, to help the listener understanding better is a normal reaction. However, unexpectedly, one does the same as the listener when he/she is unable to comprehend the speaker. Herein, we suggest a hypothesis proposing the basic role of Mirror neuron system in this action. Most of the research on these cells have been conducted on monkeys, where the researchers observed that, these neuron discharge pulses both when a monkey performs an action and when it observes another monkey or a person committing the similar action.

Conclusion The driving mechanism of an unanticipated action of taking off mask while listening to a speaker is emphasized in this paper. Herein, we try to clarify how we came up with the idea that mirror neuron system drives a surprising action observed in COVID-19 pandemics days. As a result, we suggest possible clinical studies to verify our hypothesis.

Keywords Mirror neuron system · COVID-19 · Facial mask · Communication difficulty

The COVID-19 (coronavirus) outbreak was first identified in December 2019 in Wuhan, China. Later on March 12th 2020, WHO (World Health Organization) announced this outbreak as a pandemic [1]. Thereafter, wearing face masks, social distancing, and frequent hand washing were highly recommended as effective preventive acts. Due to its double duty protection, more than 50 countries have enforced compulsory face mask policies in public areas. However, if used thoughtlessly, the masks can also cause undesired side effects. While masks save lives, they also create social challenges like verbal communication difficulties which are more considerable for people suffering from hearing impairment. In cases that verbal communication cannot be fully effective (e.g. in crowded environments, in areas with high noise level, or for people with hearing disabilities) the brain employs the lip-reading mechanism to improve the communication.

Nowadays, cloth masks that people wear in public areas are major obstacles to lip-reading. Transparent face masks and face shields are available alternatives to cloth face masks providing the possibility of lip-reading. Unfortunately, they do not provide adequate protection from COVID-19 and are not currently approved as a substitute for cloth masks [2].

As wearing non-transparent facial masks has become rather common in pandemic days, whenever an audience cannot understand one's message, the speaker takes off his/her mask to add the lip-reading assistance to the communication. This is a very logical and expected reaction. However, some people take their masks off even when they cannot understand others' meaning which is quite surprising. This is unexpected, because taking off the listener's mask does not have any influence on delivering speech.

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ORIGINAL ARTICLE

Check for updates

Results of Surgical Treatment in Patients with Intracranial Arachnoid Cyst During Last 5 Years in a Referral Center in a Developing Country: Shiraz, Iran

Mohammadsadegh Masoudi[1], Omid Yousefi[2], Pouria Azami[2]

OBJECTIVE: To report the outcome of surgical intervention in patients diagnosed with arachnoid cyst (AC) during the last 5 years in Namazi Hospital, a tertiary center in Southern Iran.

METHODS: Hospitalization records of patients who had undergone surgical treatment of symptomatic intracranial AC in our center were surveyed retrospectively. Radiologic imaging was extracted from the picture archiving and communication system and analyzed. Postoperative evaluation of patients was conducted in neurosurgery clinic during their routine follow-up.

RESULTS: Twenty-nine patients (11 female, 18 male) with an age range of 13 days to 35 years were enrolled in this study. Most (62%) of all ACs were in the temporal area, 12% in the suprasellar region, 6% in the quadrigeminal region, 6% in the cerebellopontine angle, and 3% in the anterior frontal area. Twenty-six endoscopic intervention, 2 microsurgical resection, and 1 cystoperitoneal shunt were performed. All of the patients showed complete resolution or improvement in symptoms. Eighty-nine percent of patients also showed reduction in the cyst size. Ten patients had transient postoperative complications, which were resolved at the time of follow-up.

CONCLUSIONS: Diagnosis and appropriate surgical treatment of AC can alleviate the symptoms in patients who fulfill the criteria for surgery. Neuroendoscopy can provide a satisfactory result in symptomatic patients, whilst having less invasiveness and long-term complications. Reoperation should also be considered in situations where medical therapy fails to manage the complications.

INTRODUCTION

Arachnoid cysts (ACs) are benign masses containing cerebrospinal fluid (CSF)-like content. They represent 1% of all intracranial masses in adults and 2.6% in pediatric patients.[1] They are etiologically categorized into congenital and secondary. Congenital cysts are the result of abnormality in development of subarachnoid space and the secondary cysts are developed after infection, hemorrhage, or trauma.[1,2] Symptoms are mostly due to compression effect on adjacent structures, and different symptoms can be expected based on the location of the cysts.

Development of imaging techniques and easier access to computed tomography (CT) and magnetic resonance imaging (MRI) scans have led to earlier diagnosis of AC in comparison with the past. It is important to diagnose and treat symptomatic patients having AC. Based on the cyst location and the experience of surgeons, different techniques such as microsurgery, endoscopic intervention, and cystoperitoneal (CP) shunt can be considered.[3-5] Of course, there is no consensus about the preferred surgical method in management of AC, and there are a lot of controversies and variabilities among different centers. In this study, we aimed to report the outcome of the surgical intervention in patients with

Key words
- Arachnoid cyst
- Cystoperitoneal shunt
- Microsurgical resection
- Neuroendoscopy

Abbreviations and Acronyms
AC: Arachnoid cyst
CP: Cystoperitoneal
CPA: Cerebellopontine angle
CSF: Cerebrospinal fluid
CT: Computed tomography
HCP: Hydrocephalus
MRI: Magnetic resonance imaging
QCAC: Quadrigeminal cistern arachnoid cyst
TAC: Temporal arachnoid cyst

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LETTER TO THE EDITOR

Letter to the Editor Regarding "Split-Pons Syndrome by Epidermoid Cyst: A Case Report and Review of the Literature"

LETTER:

We read the article entitled "Split-Pons Syndrome by Epidermoid Cyst: A Case Report and Review of the Literature" by You et al.[1] with great interest. The authors reported 2 interesting cases with recurrent epidermoid cysts (ECs) that formed in the cerebellopontine angle and manifested with cerebellar symptoms, cranial neuropathy, and long tract signs. A near-total resection of the cysts was performed in both cases. We present a similar case, with an EC diagnosed in the rare location of the foramen magnum.

ECs are benign lesions that account for 0.2%–1.8% of all intracranial tumors, which are caused through malformation in the gastrulation phase of embryogenesis. Common locations for ECs include cerebellopontine angle and parasellar cisterns.[2] Table 1 describes the anatomic distribution of ECs diagnosed at 5 centers.[3–7]

CASE DESCRIPTION

A 41-year-old woman was referred to our clinic with symptoms of ataxia, vertigo, and inability to walk. On physical examination, she had abnormal tandem gait and impaired heel to shin and finger to nose tests. Cranial nerve examination was unremarkable. Funduscopy was negative for papilledema. The patient's extremities had normal muscle strength. Deep tendon reflexes were 3+ in all extremities.

Neuroimaging studies revealed a cystic lesion in the tonsillomedullary cistern with compression over the medulla oblongata (Figure 1). The cyst was isointense to cerebrospinal fluid on both T1-weighted and T2-weighted magnetic resonance images and was poorly enhanced following gadolinium injection on contrast T1-weighted images.

The presence of long tract and cerebellar compression signs mandated surgical resection. The procedure was started following neuroanesthesia and securing the patient in a prone position with the head placed on a horseshoe headrest. A midline suboccipital craniectomy was performed. After opening the dura mater, the cyst was visualized anterior and inferior to the cerebellar tonsils. The cyst was removed in a piecemeal fashion with several pearly white fragments. After microscopic total resection and meticulous hemostasis, irrigation with dexamethasone and normal saline solution was performed. Dura mater was closed primarily, and the wound was closed in anatomic layers on a Hemovac drain. In the early postoperative period, the patient was ambulatory, and her symptoms of vertigo and ataxia were completely improved.

A few points in our case are worthy of note. First is the location of the ECs. Posterior fossa ECs are most commonly seen in the cerebellopontine angle[2]; however, in our case, in contrast to the cases reported by You et al.,[1] the cyst was in the midline, with extension into the lower part of the fourth ventricle and splayed over cerebellar tonsils in the foramen magnum, which is an extremely rare location for ECs. ECs are usually off the midline. If the EC is in the midline, as in our case, it may be mistaken for other lesions in radiologic images. The differential diagnosis of ECs in midline foramen magnum includes dermoid cysts, neurenteric cysts, arachnoid cysts, and mega cisterna magna.

Second is the appearance of our patient's EC. ECs are white in color and have irregular, nongeometric shapes in general; however, in our case, the cyst was notably round, white, and geometric and so similar to a pearl that initially it was difficult to differentiate from a real pearl. Such lesions are called the "most beautiful tumors of all the tumors" because of their pearly appearance (Figure 2).[8] It is compelling that these beautiful cysts can be simultaneously dangerous by a gradual increase in size. Based on their size and location, ECs can be asymptomatic or can manifest with symptoms of compression over the cortex, brainstem structures, cranial nerves, and cerebellum or manifest with different symptoms depending on their location. Sudden death due to an EC has also been reported in the literature.[8]

Table 1. Anatomic Distribution of the Intracranial Epidermoid Cysts in 5 Centers

Author, Year	Total Cases	Location of Cysts
Yamakawa et al., 1989[3]	33	CPA (45.5%), middle fossa (15.15%), cerebral hemisphere (15.15%), supraseller region (9.09%), third ventricle (9.09%), fourth ventricle (6.06%)
Altschuler et al., 1990[4]	13	CPA (84.62%), supraseller (15.38%)
Talacchi et al., 1998[5]	28 (posterior cranial fossa ECs)	CPA (71.43%), posterior fossa basal (10.71%), fourth ventricle (17.86%)
Ren et al., 2012[6]	24 (atypical ECs)	CPA and/or sellar and/or parasellar region (66.67%), frontal lobe (8.33%), temporal lobe (8.33%), parietal lobe (4.17%), parafalcine (4.17%), cerebellar vermis (8.33%)
Tiwari et al., 2013[7]	34	CPA (67.65%), supratentorial (26.47%), cisterna magna (2.94%), fourth ventricle (2.94%)

CPA, cerebellopontine angle; EC, epidermoid cyst.

ORIGINAL ARTICLE
Oman Medical Journal [2021], Vol. 36, No. 2: e251

Differentiating Between Low- and High-grade Glioma Tumors Measuring Apparent Diffusion Coefficient Values in Various Regions of the Brain

Farideh Momeni[1,2], Razzagh Abedi-Firouzjah[3], Zahra Farshidfar[4], Nastaran Taleinezhad[1], Leila Ansari[1], Ali Razmkon[5], Amin Banaei[5,6]* and Alireza Mehdizadeh[1,2]*

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Magnetic Resonance Imaging; Diffusion Weighted MRI; Glioma.

ABSTRACT

Objectives: Our study aimed to apply the apparent diffusion coefficient (ADC) values to quantify the differences between low- and high-grade glioma tumors. ***Methods:*** We conducted a multicenter, retrospective study between September to December 2019. Magnetic resonance imaging (MRI) diffusion-weighted images (DWIs), and the pathologic findings of 56 patients with glioma tumors (low grade = 28 and high grade = 28) were assessed to measure the ADC values in the tumor center, tumor edema, boundary area between tumor with normal tissue, and inside the healthy hemisphere. These values were compared between the two groups, and cut-off values were calculated using the receiver operating characteristic curve. ***Results:*** We saw significant differences between the mean ADC values measured in the tumor center and edema between high- and low-grade tumors ($p < 0.005$). The ADC values in the boundary area between tumors with normal tissue and inside healthy hemisphere did not significantly differ in the groups. The ADC values at tumor center and edema were higher than 1.12×10^{-3} mm^2/s (sensitivity = 100% and specificity = 96.0%) and 1.15×10^{-3} mm^2/s (sensitivity = 75.0% and specificity = 64.0%), respectively, could be classified as low-grade tumors. ***Conclusions:*** The ADC values from the MRI DWIs in the tumor center and edema could be used as an appropriate method for investigating the differences between low- and high-grade glioma tumors. The ADC values in the boundary area and healthy tissues had no diagnostic values in grading the glioma tumors.

Glioma tumors are the most common tumors of the central nervous system causing 40–50% of brain tumors and 2–3% of all cancers globally.[1] Despite modern techniques developed for brain tumor treatments, high-grade gliomas are still considered hard responding to treatments.[2] Early diagnosis of malignant glioma helps successful treatment;[3] therefore, developing methods to detect malignant tumors is essential. It has been demonstrated that Magnetic resonance imaging (MRI) is a valuable diagnostic tool in oncology due to the high spatial resolution and contrast of soft tissues.[4–6] Although common MRI sequences have many advantages in the diagnosis and evaluation of brain tumors, these sequences are not effective tools for differentiation of the tumor types or grades.[4]

Diffusion-weighted imaging (DWI) relies on the diffusion of water molecules to create contrast between normal and abnormal tissues; it has a proven ability to differentiate between benign and malignant tumors in various sites.[4,7,8] Apparent diffusion coefficient (ADC) values are obtained from a series of DWIs with different gradients.[9] Previous studies had shown that ADC measurement could distinguish several certain types of brain and cerebral tumors, including malignant and benign meningiomas, high-grade and low-grade gliomas, brain metastasis, and vestibular schwannomas.[10–12]

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Applied Magnetic Resonance

ORIGINAL PAPER

Synthesis, Characterization and MRI Application of Cobalt-Zinc Ferrite Nanoparticles Coated with DMSA: An In-vivo Study

Leyla Ansari[1] · Ibrahim Sharifi[2] · Hadis Ghadrijan[3] · Negar Azarpira[4,5] · Farideh Momeni[1] · Hamed Zamani[6] · Naser Rasouli[1] · Mahdi Mohammadi[7] · Alireza Mehdizadeh[1,8] · Razzagh Abedi-Firouzjah[9]

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Abstract
The aim of this study was to synthesize and characterize the dimercaptosuccinic acid (DMSA) cobalt–zinc (Co–Zn) ferrite magnetic nanoparticles (NPs) and their efficiency as a contrast agent in in vivo MR imaging of rat liver. Co–Zn ferrite NPs were synthesized by the thermal decomposition method and stabilized by DMSA. The NPs were characterized by different analyses to study their physical and magnetic properties and were injected into 6 adult male rats. Liver MRI was performed to measure the signal intensity at different times. The average nanoparticle size was estimated at about 8 ± 1 nm using transmission electron microscopy (TEM). The r_2 and r_2^* relaxivity of these particles were obtained at 32.85 and 168.96 mmol L^{-1} s^{-1}, respectively, using an agarose phantom imaged by MRI. In the in vivo condition, injection of SNPs (2.5 mg Fe/kg) showed negative contrast in a way that for T_2 and T_2^* weighted the maximum contrast enhancement was 58.46 and 77.13%, respectively. Regarding our results, the synthesized Co–Zn ferrite NPs stabilized by DMSA are appropriate agents for increasing the contrast in both T_2 and T_2^* weighted based on MR imaging in rat liver.

1 Introduction

Magnetic resonance imaging (MRI) has been a powerful technology as a diagnostic method for in vivo assessment of diseases with high resolution [1]. Enhancing the tissue contrast of the images obtained from this technique by adding extrinsic agents has become the necessary process for lots of patients. Magnetic NPs are widely used as

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Medical image registration using deep neural networks: A comprehensive review ☆

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ABSTRACT

Image-guided interventions are saving the lives of a large number of patients where the image registration should indeed be considered as the most complex and complicated issue to be tackled. On the other hand, a huge progress in the field of machine learning has recently made by the possibility of implementing deep neural networks on the contemporary many-core GPUs. It has opened up a promising window to challenge with many medical applications in more efficient and effective ways, where the registration is not an exception. In this paper, a comprehensive review on the state-of-the-art literature known as medical image registration using deep neural networks is presented. The review is systematic and encompasses all the related works previously published in the field. Key concepts, statistical analysis from different points of view, confining challenges, novelties and main contributions, key-enabling techniques, future directions, and prospective trends all are discussed and surveyed in details in this comprehensive review. This review allows a deep understanding and insight for the readers active in the field who are investigating the state-of-the-art and seeking to contribute the future literature.

1. Introduction

In most medical interventions, there are a number of cases in which some images need to be captured for diagnosis, prognosis, treatment, and follow-up purposes. These images can vary in terms of temporal, spatial, dimensional, or modular. Image fusion causing information synergy can have a significant contribution to guide and support physicians in the process of decision making, mostly in an online and real-time fashion. Lack of alignment is unavoidable for these images taken at different times, conditions, and setups; hence, can challenge the quality and accuracy of the subsequent analyses. Image registration is the process of aligning two (or more) given images based on an identical geometrical coordination system. The aim is at finding an optimum spatial transformation that registers the structures-of-interest in the inputted images in the best way. This problem is important in numerous ways in the field of machine vision e.g. for remote sensing, object tracing, satellite imaging, and so on [1].

Image registration is also fundamental to the image-guided intervention where e.g. telesurgery, Image-Guided Radiotherapy (IGRT), and precision medicine cannot be operational without the proper utilization of image registration techniques

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Editorial

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beat

Tranexamic Acid; A Glittering Player in the Field of Trauma

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Trauma is still the leading cause of mortality and morbidity worldwide with an estimated 5.8 million mortalities every year [1] and approximately 60 million traumatic brain injuries (TBI) annually [2]. Hemorrhage remains the most common preventable cause of mortality and morbidity following trauma either in civilian or military settings [3, 4]. Intracranial bleeding following TBI results in increased intracranial pressure (ICP), brain herniation and cerebral edema which are all secondary insults to the brain parenchyma leading to increase disability and mortality [5]. Thus, the development and administration of antifibrinolytic agents have been the focus of traumatic injuries during the previous decades with the hypothesis of hemorrhage cessation and hemostasis with a medical agent rather than a surgical intervention. These efforts resulted in developing several agents and subsequent large multicenter clinical trials to define the best antifibrinolytic agent for prevention of death following TBI.

Tranexamic acid (TXA), an antifibrinolytic agent being introduced in 1962, has been spotlight of the TBI treatment during the past decade [6]. TXA provides its antifibrinolytic effects through binding to the plasminogen molecule which in turns blocks connection of the plasminogen to the plasmin and fibrin. These cascades lead to stabilization of the formed network through secondary hemostasis. The drug is administered through oral and intravenous routes and has a bioavailability of 33 and 90% respectively [7]. Several applications have been approved for the TXA including the trauma, obstetrics and gynecology condition (menstrual bleeding, obstetrics bleeding), orthopedics surgery, spinal surgeries, dental procedures, hemoptysis, hemophilia, and epistaxis [6, 8, 9].

Until now, several studies have addressed the effects of the TXA on the patients with trauma with an emphasis on the TBI [10-12]. The two main projects accordingly include the Clinical Randomization of an Antifibrinolytic in Significant Hemorrhage (CRASH) [10, 11] and Military Application of Tranexamic Acid in Trauma Emergency Resuscitation (MATTERs) [13]. Very recently, the results of the CRASH-3 was published which provides the highest level of evidence regarding the efficacy and safety of the TXA in patients with TBI [10]. In addition, several lines of recent evidence have demonstrated that pre-hospital and early administration of TXA leads to clot stabilization and a reduction of fibrinolytic activity, causing a decrease in fibrin degradation products buildup (D-dimer) [14] which in turn is associated with prolonged time to death and significantly improved early survival [15].

We herein, discuss and summarize the results of these three main studies in order to emphasis on

LITERATURE REVIEW

Check for updates

Intravenous Acetaminophen (Paracetamol) for Postcraniotomy Pain: Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Key words
- Acetaminophen
- Craniotomy
- Meta-analysis
- Postoperative pain

Abbreviations and Acronyms
CI: Confidence interval
ICU: Intensive care unit
LOS: Length of stay
RCT: Randomized controlled trial
SMD: Standardized mean difference

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BACKGROUND: Acute pain control after supratentorial craniotomy is considered among the most important indicators of postoperative recovery. The aim of this study was to determine the effects of intravenous acetaminophen on postcraniotomy pain.

METHODS: We searched databases including Embase, Scopus, Medline, Cochrane Library, and Web of Science until April 2019. Cochran Q test and I^2 statistic were used to assess the heterogeneity across included clinical trials. Standardized mean difference (SMD) and 95% confidence interval (CI) were used to estimate pooled effect sizes.

RESULTS: Out of 479 reports, 5 randomized controlled trials met the inclusion criteria and were appropriate for our meta-analysis, which included a total of 2635 patients. The pooled results of included clinical trials indicated that paracetamol intake significantly decreased rescue dose (SMD, −0.67; 95% CI, −1.15 to −0.19; $P < 0.01$; $I^2 = 90.0\%$), total dosage of rescue (SMD, −0.78; 95% CI, −1.18 to −0.37; $P < 0.01$; $I^2 = 86.0\%$), intensive care unit length of stay (SMD, −0.24; 95% CI, −0.44 to −0.04; $P = 0.01$; $I^2 = 0.0\%$), and visual analog scale score (SMD, −0.16; 95% CI, −0.31 to −0.00; $P = 0.04$; $I^2 = 71.7\%$) and increased patient satisfaction (SMD, 0.28; 95% CI, 0.14–0.43; $P < 0.01$; $I^2 = 10.2\%$) among patients with craniotomy. Time to rescue (SMD, 0.21; 95% CI, −0.42 to 0.85; $P = 0.51$; $I^2 = 94.3\%$) and hospital length of stay (SMD, −0.04; 95% CI, −0.24 to 0.16; $P = 0.69$; $I^2 = 0.0\%$) did not significantly change after paracetamol intake.

CONCLUSIONS: The results of this systematic review and meta-analysis indicate that preoperative intravenous administration of acetaminophen is associated with decreased postoperative pain, need for rescue analgesics, and dosages of analgesics after craniotomy surgery.

INTRODUCTION

Acute pain control after supratentorial craniotomy is considered among the most important indicators of postoperative recovery.[1] Uncontrolled postoperative pain after elective craniotomy will result in patient discomfort, agitation, and increased risk of postoperative complications including increased intracranial hypertension, hematoma formation, deep vein thrombosis, and longer duration of intensive care unit (ICU) and hospital stay.[2-4] Currently, the incidence of postcraniotomy pain in an elective setting has been estimated to range between 6% and 8%.[5,6] Although there is an international consensus regarding optimal postcraniotomy pain control, there is great controversy in treatment options and medical choices.[7,8] Opioids have been shown to provide appropriate pain control after craniotomy; however, their use is limited in neurocritical care units because of their effects on the level of consciousness and neurologic status (deterioration of neurologic status and miosis).[9]

Paracetamol, the intravenous formulation of acetaminophen, has evolved in recent decades for pain control in the acute setting and has been shown to be associated with appropriate pain control and fewer complications and side effects.[9,10] The drug is available internationally and is a nonopioid agent associated with limited side effects and high bioavailability and long half-life, making it suitable for management of postoperative pain in various settings.[11] Several lines of evidence have demonstrated that intravenous acetaminophen reduces the opioid requirement and increases the postoperative comfort level.[12,13] However, its efficacy and safety in neurosurgical patients and those undergoing elective craniotomy have been teared in limited studies, among which there are only some randomized controlled trials (RCTs), with

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MicroRNA-199a Upregulation Mediates Lumbar Intervertebral Disc Degeneration and is Associated with Clinical Grades of Degeneration

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This study has been presented at the 26th International Student Congress of (bio) Medical Sciences (ISCOMS 2019) between 3 and 7 June 2019 at Leiden, Netherlands.

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ABSTRACT

AIM: To determine the expression profile of miRNA-199a-5p in intervertebral disc degeneration (IDD) and its correlation to the grade of IDD.

MATERIAL and METHODS: This case-controlled study was conducted during a 6-month period from 2017 to 2018 in two university hospitals in Shiraz, Iran. We included 15 patients with grade 3 and 4 of Pfirrmann and 5 patients with traumatic lumbosacral fractures with grade I. Total discectomy was performed in all the individuals and the samples were sent to the laboratory. The nucleus pulposus (NP) cells were isolated and the RNA was extracted, cDNA was synthesized by reverse transcriptase and the expression was measured using real-time polymerase chain reaction (RT-PCT).

RESULTS: We overall included 20 patients in two study groups. Both study groups were comparable regarding the baseline and clinical characteristics except for age (p=0.026). The fold change (p=0.007), and relative expression (p=0.012) of the miRNA-199a-5p was found to be significantly higher in patients compared to controls. The fold change (p<0.001), and relative expression (p<0.001) were also associated with the Pfirrmann grading. We found that the area under curve (AUC) was 0.860 (95%CI: 0.721-0.938) indicative of moderate accuracy.

CONCLUSION: Expression of the miRNA-199a-5p is increased in the IDD. The expression of the miRNA-199a-5p was also associated with the grade of the degeneration based on the Pfirrmann grading.

KEYWORDS: Intervertebral disc degeneration, MicroRNA-199a, Target genes, Pfirrmann grade

INTRODUCTION

Intervertebral disc degeneration (IDD) is currently considered the etiology of low back pain (LBP) which is the second most common complain of the patients referring to the outpatient clinics worldwide (12). LBP is associated with high disease burden and disability worldwide. According to the global burden of the disease, LBP ranked highest in terms of disability (YLDs), and sixth in terms of overall burden (DALYs) with a global prevalence of 9.4% in 2010, increasing with age (6). There are several key steps identified in IDD which includes loss of extracellular matrix, endplate cartilages hyperplasia and subsequent sclerosis, loss of height and release of pro-inflammatory cytokines (19,24). The nucleus pulposus (NP) cells are cartilage-like cells with minimal regenerative

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Research Paper:

Risk Factors of Neural Tube Defects in a Sample of Iranian Population From Southern Iran: A Hospital-based Investigation

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Neural Tube Defect (NTD), Risk factors, Folic acid, Geographic distribution

ABSTRACT

Background and Aim: The risk factors of the Neural Tube Defects (NTD) have been previously described but there are ethnic and geographical variations. Data from the Iranian population is still scarce. The objective of the current study was to investigate the NTDs risk factors in a large sample of Iranian patients admitted to a single center.

Methods and Materials/Patients: This case-control study was performed within five years from 2012 to 2017 in Namazi Hospital of Shiraz, a tertiary referral center for neonatal anomalies in the south of Iran. One hundred newborns with NTDs were included in the study as the case group and 200 healthy newborns as the control group. We recorded the baseline characteristics including the maternal variables (age, weight, height, previous pregnancy and gravidity, gestational age), newborn information (birth weight, clinical diagnosis, clinical findings in the examination, and clinical findings in radiologic test) and medical history of the perinatal period.

Results: The baseline characteristics of the mothers were matched in both groups. NTDs were associated with lower folic acid intake during pregnancy (66% vs. 78%; P=0.030; OR 95% CI=1.82) and before pregnancy (P=0.002; OR95% CI=2.36). The prevalence of NTD was significantly higher in patients who lived in hot climates (P=0.001).

Conclusion: Taking adequate folic acid supplements before and during pregnancy can reduce the risk of NTDs in the Iranian population. Hot climate zones were associated with an increased risk of NTDs in Iran.

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Case Report

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Using Preimplanted Deep Brain Stimulation Electrodes for Rescue Thalamotomy in a Case of Holmes Tremor: A Case Report and Review of the Literature

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Keywords
Holmes tremor - Rescue thalamotomy - Lesioning - Deep brain stimulation

Abstract

Background: Chronic stimulation of the thalamus is a surgical option in the management of intractable Holmes tremor. Patients with deep brain stimulation (DBS) can encounter infection as a postoperative complication, necessitating explantation of the hardware. Some studies have reported on the technique and the resulting efficacy of therapeutic lesioning through implanted DBS leads before their explantation. ***Case Description:*** We report the case of a patient with Holmes tremor who had stable control of symptoms with DBS of the nucleus ventralis intermedius of the thalamus (VIM) but developed localized infection over the extension at the neck, followed by gradual loss of a therapeutic effect as the neurostimulator reached the end of its service life. Three courses of systemic antibiotic therapy failed to control the infection. After careful consideration, we decided to make a rescue lesion through the implanted lead in the right VIM before explanting the complete DBS hardware. The tremor was well controlled after the rescue lesion procedure, and the effect was sustained during a 2-year follow-up period. ***Conclusion:*** This case and the previously discussed ones from the literature demonstrate that making a rescue lesion through the DBS lead can be the last plausible option in cases where the DBS system has to be explanted because of an infection and reimplantation is a remote possibility.

Introduction

Holmes tremor (HT) occurs after a lesion involving the cerebellum, midbrain, or thalamus [1, 2]. Such lesions are usually a result of hemorrhage, trauma, tumors, or infection [3–10]. Lesions affecting specific tracts, such as the cerebellothalamic or nigrostriatal tract, are considered the main cause of HT [2, 11–13]. It is a combination of resting, postural, and intention tremor.

In some cases, the tremor is responsive to different medical treatments. However, for the majority of patients, medication fails to alleviate the tremor, in which case stereotactic interventions are considered [14–16]. Studies have shown the efficacy of ablative and stimulation procedures in the management of HT. Sometimes, thalamotomy may have some short- and long-term complications, which may not be reversible and manageable [8, 17]. Deep brain stimulation (DBS) of the nucleus ventralis intermedius of the thalamus (VIM) could be care-

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Editorial:
Ventrolateral Preoptic Nucleus of Hypothalamus: A Possible Target for Deep Brain Stimulation for Treating Sexual Dysfunction

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Ventrolateral Preoptic Nucleus (VLPO), Hypothalamus, Sexual orientation

ABSTRACT

Sexual function and orientation is a complex platform of human personality which is being modulated by several brain circuities which is less understood currently. Recently, several studies have demonstrated interesting results regarding the role of several brain locations in sexual behaviors and orientation. Sexual arousal in homosexual men are associated with activation of the left angular gyrus, left caudate nucleus, Ventrolateral Preoptic (VLPO) Nucleus of Hypothalamus and right pallidum; while it is associated with bilateral lingual gyrus, right hippocampus, and right parahippocampal gyrus in heterosexual men. We postulate that sexual-orientation behaviors are being mediated by several circuits in the brain in the center of which the VLPO is playing an indistinguishable role. We hypothesize that the different aspects of the sexual dysfunction could be associated with innate or acquired lesions of VLPO. Accordingly, the electrical stimulation of the nucleus in those with sexual dysfunction would be a treatment option. Thus the VLPO could be considered a target for Deep Brain Stimulation (DBS) in individuals with impaired sexual function.

The basic neuroscientific infrastructure of the sexual orientation and the gender disorders have been the matter of several studies without clear evidence and physiology [1]. Recently, Epprecht et al. [2] have addressed an important issue in patients with Subarachnoid Hemorrhage (SAH) which affects the quality of life to a great extent. The results of this study demonstrated that sexual dysfunction is a common problem even after good grade SAH. Decreased sexual desire and loss of orgasmic experience were among the most common reported problems. The results of this study along with our own experience and other lines of evidence, lighted up an idea regarding the sexual function and sexual orientation.

Sexual function and orientation is a complex platform of human personality which is being modulated by sev-

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Letter: Older Patients Have Better Pain Outcomes Following Microvascular Decompression for Trigeminal Neuralgia

To the Editor:

We have read with a great interest the invaluable research by Bick et al[1] that has been published in the latest issue of *Neurosurgery*. In this retrospective review of 135 patients with typical trigeminal neuralgia (TN) with radiological evidence of neurovascular compression (arterial and/or venous), the authors demonstrated that patients older than 60 yr have better pain outcomes compared to younger patients through univariate and multivariate regression analysis. The article is invaluable as the literature is still scarce on the subject and the role of various risk factors on determination of outcome of those with TN is a matter of debate.

The outcome of TN as indicated by the authors is affected by several confounders that make it hard to determine the exact role of factors. The authors have indicated that they have ran a literature review to determine the current confirmed factors affecting the outcome in their analysis. In the current study, disease duration, having undergone pervious procedures for TN, the presence of arterial compression, preoperative trigger points, preoperative medication responsiveness, and dermatomes involved, were included as the factors affecting the outcome.[1] When looking at the literature there are several more important variables available that could or should have been included in the analysis in order to decrease the role of confounders and bias in the results of the study. The major risk factor for TN is multiple sclerosis (for unilateral TN—risk ratio [RR], 20.0; 95% CI, 4.1-59.0).[2] Hypertension is a risk factor in women (RR, 2.1; 95% CI, 1.2-3.4), but the evidence is less clear for men (RR, 1.53; 95% CI, 0.30-4.50).[3] A history of TN in a first-degree relative is also a minor risk factor.[2] Recent lines of evidence have also demonstrated that diabetes mellitus (DM) is considered a risk factor for development[4] and poor outcome[5] of patients with TN undergoing microvascular decompression. The role of obesity and other comorbidities[6] and also the presence of other psychiatric disease such as depression have also been investigated vastly with various results and conclusions.[7] Although none of these previous studies are flawless, and the results are considered as level III of evidence; including them in a multivariate regression model of similar studies is recommended to decrease the role of confounders.

The other issue worth consideration is determining the cut-off value for age in these patients. How did the authors come to 60 yr as the cut-off value for the age? This value could be estimated both clinically or based on ROC analysis models. However, there is no description of its calculation in the article. In addition, the comparisons have all been made based on a categorical age (above and below 60 yr). They could also consider the age as a parametric variable and calculate the Pearson correlation coefficient regarding the pain outcomes. The age could have also been compared between those with favorable and unfavorable pain outcomes as a parametric continuous variable using the appropriate tests. As addressed in the current issue of the journal, the concept of the biostatistics should be used to better analyze and understand the complex association of clinical variables in order to come to an appropriate clinical conclusion, which will benefit the patients.[7]

Again, we thank the authors for their novel idea and nicely designed and presented study that shed light on some aspects of the TN outcome factors; however, we believe when coming to a robust conclusion such as the one presented by this study, we should be cautious, as their might be several other factors that would affect the results.

Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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Determinants of reoperation after decompressive craniectomy in patients with traumatic brain injury: A comparative study

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Decompressive craniectomy (DC)
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ABSTRACT

Objectives: Reoperation after decompressive craniectomy (DC) in patients with traumatic brain injury (TBI) remains a dilemma and the risk factors are to be identified. The aim of the current study was to determine the determinants and risk factors of reoperation after DC in patients with TBI.

Patients and methods: This retrospective case-controlled study was conducted during a 4-year period from September 2013 to October 2017 in a level I trauma center affiliated with Shiraz University of Medical Sciences in southern Iran. We included all the adult (≥ 18 years) patients with TBI who underwent primary or secondary DC in our center during the study period. Those who underwent reoperation were compared to those who underwent DC only regarding the demographic findings, clinical features and neuroimaging findings. A univariate and multivariate logistic regression analysis was performed to determine the determining factors of reoperation.

Results: Overall we included 371 patients with mean age of 36.45 ± 14.18 years. Among the patients there were 325 (87.6%) men and 46 (12.4%) women. The reoperation in patients undergoing DC due to TBI was associated with primary DC ($p = 0.039$) and higher Marshall grade ($p = 0.027$). Those who underwent reoperation after DC for TBI had significantly higher ICU ($p = 0.007$) and hospital LOS ($p = 0.001$) and lower 6-month GOSE ($p = 0.010$). Age ($p < 0.001$), GCS ($p < 0.001$) and pupils ($p = 0.027$) were predictors of outcome in reoperation group. Reoperation in primary DC group was associated with pupil reactivity ($p = 0.002$) and number of episodes with ICH above 1.5 ($p = 0.037$)

Conclusion: Reoperation after DC for TBI is associated with primary DC, and Marshall grade. The reoperation after DC is associated with worse outcome and longer ICU and hospital stay. The age, GCS and pupil reactivity are the main predictors of outcome in those with reoperation after DC for TBI.

1. Introduction

Traumatic brain injury (TBI) is a critical public health and socio-economic problem throughout the world [1–3]. It is the leading cause of mortality and disability among young individuals in high-income countries and the most common cause of mortality and years of potential life lost (YPLL) of individuals between 18 and 44 years in developing countries [4,5]. Worldwide, the incidence of TBI is rising sharply, mainly because of increase in use of motor vehicles in low and middle income countries [1]. TBI will surpass many diseases as the major cause of death and disability by the year 2020 [6]. It is often referred to silent epidemic [7]: silent insofar as patients are not vociferous because of the invisibility of symptoms and low awareness of the chronicity of its sequelae and insofar as society in general is largely unaware of the magnitude of the problem.

Decompressive craniectomy (DC) is among the available surgical treatments in patients with TBI suffering from intracranial evacuable pathologies (primary DC) or refractory intracranial hypertension (secondary DC); however, its role in decreasing mortality and morbidity is controversial which is subjected to large scale randomized clinical trials

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LITERATURE REVIEW

MicroRNA Expression Profiles, Target Genes, and Pathways in Intervertebral Disk Degeneration: A Meta-Analysis of 3 Microarray Studies

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Key words
- Expression
- Intervertebral disk degeneration
- Meta-analysis
- MicroRNA
- Pathway
- Target gene

Abbreviations and Acronyms
AF: Annulus fibrosis
ECM: Extracellular matrix
GO: Gene Ontology
IDD: Intervertebral disk degeneration
LBP: Chronic low back pain
miRNA: MicroRNA
NP: Nucleus pulposus

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BACKGROUND: Determining the expression profile and target genes of microRNA (miRNA) would assist in determining the pathophysiologic pathways in intervertebral disk degeneration (IDD). The aim of this study was to determine the expression profile of miRNA in degenerated intervertebral disks compared with normal healthy intervertebral disks.

METHODS: We conducted a meta-analysis of 3 available miRNA expression datasets to identify a panel of co-deregulated miRNA genes and overlapping biological processes in IDD. Degenerated intervertebral disks were compared with normal healthy disks. We selected 35 miRNA features common to all 3 platforms. Then, we calculated differential expression *P* values from our unpaired data using metaMA package in R statistical software according to the moderated *t* test method (Limma). Based on the *P* values (where the threshold was <0.05), a list of differentially expressed miRNAs was identified.

RESULTS: After normalization and selection of common miRNA features across all 3 platforms, we found a total of 5 differentially expressed miRNAs, among which miR-574-3p, miR-199a-5p, and miR-483-5p were not identified in any individual studies. Our results revealed that miR-199a-5p, miR-574-3p, miR-558, and miR-640 are commonly upregulated in IDDs compared with control disks, whereas miR-483 is commonly downregulated. Pathway analysis of identified dysregulated miRNAs indicated the involvement of extracellular matrix–receptor interaction, adherens junction, and transforming growth factor-beta signaling pathway in the pathogenesis of IDDs. Moreover, the network of predicted targets for these miRNAs identified most affected target genes as *ERBB4* and *CLTC*.

CONCLUSIONS: We found that the identified miRNAs through meta-analysis are candidate predictive markers for IDDs through different pathways.

INTRODUCTION

With over 600 million individuals afflicted, chronic low back pain (LBP) is the leading cause of years lived with disability worldwide.[1,2] At any given moment, an estimated 12% of the global population suffers from LBP. The prevalence of LBP reaches 38% annually,[3] and lifetime prevalence has been reported to be as high as 80%.[3] The effective management of LBP consequently requires an in-depth understanding of both the normal structure and function of the lumbar spine and the pathophysiologic changes that arise with degenerative disease.[4] The relationship of LBP to intervertebral disk degeneration (IDD) remains poorly understood.[2,3] Symptomatic disk degeneration is frequently accompanied by aberrant neurovascular ingrowth within the nucleus pulposus (NP) and annulus fibrosis (AF).[5] A regional immune response is elicited by structural changes such as annular tears.[6] The resulting formation of vascularized granulation tissue evokes release of cytokines, including interleukin-6 and -8, interleukin-8 and prostaglandin E_2.[7] These inflammatory mediators are proposed to sensitize local nociceptors, thereby lowering pain thresholds.[8,9] Hypermobility of the intervertebral disk occurs in conjunction with these structural and biomechanical changes. As a consequence, the biomechanics of the lumbar spine are altered, with the loading of facet joints, ligaments, and paraspinal musculature producing potent generators of pain.[2]

Micro-RNAs (miRNAs) are noncoding small-size RNA molecules of 20–22 nucleotides in length, which play an important role in transcription regulation of various genes in humans.[10,11] They account for 1%–3% of the human genome, and up to 30% of the proteins in the human body are regulated by miRNAs. The function of miRNAs is executed by

JNS PEDIATRICS CLINICAL ARTICLE

Clinical outcome of V-Y flap with latissimus dorsi and gluteal advancement for treatment of large thoracolumbar myelomeningocele defects: a comparative study

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OBJECTIVE Surgical repair and closure of myelomeningocele (MMC) defects are important and vital, as the mortality rate is as high as 65%–70% in untreated patients. Closure of large MMC defects is challenging for pediatric neurosurgeons and plastic surgeons. The aim of the current study is to report the operative characteristics and outcome of a series of Iranian patients with large MMC defects utilizing the V-Y flap and with latissimus dorsi or gluteal muscle advancement.

METHODS This comparative study was conducted during a 4-year period from September 2013 to October 2017 in the pediatric neurosurgery department of Shiraz Namazi Hospital, Southern Iran. The authors included 24 patients with large MMC defects who underwent surgery utilizing the bilateral V-Y flap and latissimus dorsi and gluteal muscle advancement. They also retrospectively included 19 patients with similar age, sex, and defect size who underwent surgery using the primary or delayed closure techniques at their center. At least 2 years of follow-up was conducted. The frequency of leakage, necrosis, dehiscence, systemic infection (sepsis, pneumonia), need for ventriculoperitoneal shunt insertion, and mortality was compared between the 2 groups.

RESULTS The bilateral V-Y flap with muscle advancement was associated with a significantly longer operative duration ($p < 0.001$) than the primary closure group. Those undergoing bilateral V-Y flaps with muscle advancement had significantly lower rates of surgical site infection ($p = 0.038$), wound dehiscence ($p = 0.013$), and postoperative CSF leakage ($p = 0.030$) than those undergoing primary repair. The bilateral V-Y flap with muscle advancement was also associated with a lower mortality rate ($p = 0.038$; OR 5.09 [95% CI 1.12–23.1]) than primary closure. In patients undergoing bilateral V-Y flap and muscle advancement, a longer operative duration was significantly associated with mortality ($p = 0.008$). In addition, surgical site infection ($p = 0.032$), wound dehiscence ($p = 0.011$), and postoperative leakage ($p = 0.011$) were predictors of mortality. Neonatal sepsis ($p = 0.002$) and postoperative NEC ($p = 0.011$) were among other predictors of mortality in this group.

CONCLUSIONS The bilateral V-Y flap with latissimus dorsi or gluteal advancement is a safe and effective surgical approach for covering large MMC defects and is associated with lower rates of surgical site infection, dehiscence, CSF leakage, and mortality. Further studies are required to elucidate the long-term outcomes.

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KEYWORDS myelomeningocele; V-Y flap; latissimus dorsi muscle; gluteal muscle; clinical outcome; congenital

Surgical repair and closure of myelomeningocele (MMC) defects is important and vital, as the mortality rate is as high as 65%–70% in untreated patients.[4] The aim of surgical repair is to protect the neural elements by placing them in the thecal sac, stop the CSF leakage, and decrease the rate of meningitis and infection.[2,10] Limited and small defects can be closed and repaired primarily, while closure of large defects remains a challenge for neurosurgeons and plastic surgeons. Large thoracolumbar defects are associated with high mortality and morbidity, and their closure and coverage have been the subject of several research investigations. To date, sev-

ABBREVIATIONS MMC = myelomeningocele; NEC = necrotizing enterocolitis; SSI = surgical site infection; VP = ventriculoperitoneal.

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ORIGINAL ARTICLE

Check for updates

Initial Results of Bilateral Subthalamic Nucleus Stimulation for Parkinson Disease in a Newly Established Center in a Developing Country: Shiraz, Southern Iran

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OBJECTIVE: To report the establishment of a new center for deep brain stimulation (DBS) as a surgical treatment for Parkinson disease and the surgical outcomes, from 2014 to 2017 in Shiraz, Southern Iran.

METHODS: A new treatment program was established in Shiraz through a multidisciplinary team in 2014. Thirty-four patients underwent implantation of subthalamic nucleus (STN) electrodes during the last 3 years. Twenty-five patients fulfilled the minimum 6-month follow-up criteria. The baseline Unified Parkinson Disease Rating Scale (UPDRS) was assessed 1 month before surgery in both off-medication and on-medication states by a movement disorder neurologist. To evaluate the outcomes, subscores of the UPDRS were assessed in all patients before surgery and at least 6 months after the operation.

RESULTS: All 25 patients had advanced Parkinson disease categorized as stage 3 or 4 using the Hoehn and Yahr scale. STN DBS resulted in a dramatic improvement in motor function of most patients. A reduction in dopaminergic medication dosage (average 50% reduction) was observed. The mean improvement was 40% in UPDRS II and 57% in UPDRS III. No surgical or hardware complications were observed. Stimulation-related adverse effects, including increased falling and worsening of speech, occurred in a few patients after surgery. Most of the patients experienced weight gain after surgery.

CONCLUSIONS: Bilateral STN DBS is a satisfactory and safe treatment for carefully selected patients with advanced Parkinson disease. According to the results, the procedure can be performed safely and with comparable results in developing countries around the world.

INTRODUCTION

Deep brain stimulation (DBS) is an effective therapy for Parkinson disease, tremor, dystonia, and other complex neurologic and psychiatric disorders. This therapy has been used since 1990 in many centers across the world.[1] Although expensive and technically demanding, DBS is performed frequently, and numerous publications have documented its safety, benefits, and adverse events.[2–5] According to the current literature, the mean improvement in Unified Parkinson Disease Rating Scale (UPDRS) III is reported to be between 28% and 71% after surgery.[5–9] The surgery also results in 19–72% medication reduction among patients.[10–13] Although DBS is expensive, strong pharmacoeconomic studies show that, in the long term, it reduces the cost of care in surgically treated patients.[14]

The population of Iran (approximately 80 million people) is aging rapidly. More than 6% of the population is older than 60 years, which is estimated to rise steeply to 10.5% by 2025.[15] This fact increases the likelihood of acquiring neurodegenerative diseases, such as Parkinson disease, leading to increased disease burden and costs. Population-based, door-to-door studies have shown the prevalence of Parkinson disease to be as high as 284 per 100,000 population in Iran, which is considered a medium-to-high rate.[16–18] This prevalence necessitates the need to introduce new treatment modalities that will reduce disease burden. Shiraz is a major city in southwest Iran and is the referral medical center for the southern half of the country, covering at least 25 million

Key words
- Deep brain stimulation
- Developing country
- Parkinson disease
- Subthalamic nucleus

Abbreviations and Acronyms
DBS: Deep brain stimulation
INS: Implantable neurostimulator
MRI: Magnetic resonance imaging
STN: Subthalamic nucleus
UPDRS: Unified Parkinson Disease Rating Scale

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Keywords: Cerebrovascular accident (CVA); H-reflex; Operant conditioning; Inhibition

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Research Article

Exercise induced operant conditioning of the H-reflex in stroke patients: Hopes for improving motor function through inducing plastic changes in the spinal pathways

Abstract

Background: Cerebrovascular accident is a major cause of disability. Stroke survivors suffer from various severity levels of movement impairment which would substantially affect their quality of life. Several methods have been investigated for improving movement in these patients. Most of the treatment approaches are geared toward inducing neuroplasticity in the brain. Here, we introduce a novel method to induce neuroplasticity in spinal cord to compensate the cerebral insult.

Purpose: The aim of this study was to examine the ability of hemiplegic stroke patients to volitionally down-regulate the soleus H-reflex and its functional consequence. A human-computer interface was developed to monitor several neural and behavioral factors while subjects stood on a balance board. The interface would elicit an H-reflex when the criteria were met and would provide feedback to the patients about the amplitude of the H-reflex. Subjects were encouraged to down-regulate the amplitude of the reflex.

Results: The protocol was tested in 3 hemiplegic subjects. Subjects demonstrated the ability to down-regulate the H-reflex. The rate of success in this down-regulation was on average %80.14±9.96. This success rate was in strong agreement with improvement in gait symmetry and gait velocity.

Major findings: This study demonstrated that stroke survivors have the ability to down-regulate their spinal reflexes and this down-regulation was correlated with movement improvement. Conclusion. The results suggest that stroke patients have the ability to down-regulate the H-reflex amid corticospinal damages. This was accompanied by improvement in motor function.

Potential implications: The current study has provided proof of evidence to show that inducing plastic changes in the spinal cord can improve motor output in stroke survivors. This method could be another treatment approach for stroke impairment.

Abbreviations

CVA: Cerebrovascular Accident; TA: Tibialis Anterior; H-reflex: Hoffman Reflex; CPN: Common Peroneal Nerve; SL: Step Length; GII: Gait Improvement Index; SR: Success Rate

Introduction

A cerebrovascular accident (CVA) is a leading cause of death and disability worldwide [1]. In recent years, several modern rehabilitation methods have been introduced and successfully tested [2-7]. The significance of these attempts is that they have utilized new technologies to bring basic concepts in neuroscience into clinical trials. This is especially critical for patients who are assumed to have been plateaued or do not show substantial improvement with other traditional therapy methods.

In line with the recent endeavors in stroke rehabilitation, we designed a novel method with the purpose of inducing plastic changes in lower motoneurons to compensate the function of upper motoneurons. The potential of spinal circuits as a site for neurorehabilitation are largely ignored in stroke rehabilitation. Here we used a well-established notion from

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Neuropsychiatric Disease and Treatment

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ORIGINAL RESEARCH

Effects of cerebrolysin on functional outcome of patients with traumatic brain injury: a systematic review and meta-analysis

This article was published in the following Dove Medical Press Journal:
Neuropsychiatric Disease and Treatment

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Background: Traumatic brain injury (TBI) remains a main public health problem being associated with high mortality and morbidity. The functional outcome of TBI remains unfavorable despite several surgical and medical therapies. Cerebrolysin is a neuropeptide with potential neuroregenerative entities.

Objective: The aim of the current systematic review and meta-analysis was to investigate the effects of cerebrolysin on functional outcome in patients with moderate and severe TBI.

Data sources: Online databases used included Medline, Scopus, EMBASE, Google Scholar, Web of Science, and Cochrane Library.

Study eligibility criteria: All the relevant studies with randomized clinical trial and cohort design evaluating the effects of intravenous cerebrolysin vs placebo on functional outcome of patients with TBI within the English literature up to October 2018 were included.

Study appraisal and synthesis methods: The articles were reviewed by two independent authors and the data were extracted to a data sheet. I^2 and Cochran's Q-statistics were used to assess heterogeneity. Based on the presence of significant heterogeneity across included studies, data were pooled using random-effects model with Dersimonian–Laird method and presented as standardized mean differences (SMDs) and corresponding 95% CI.

Results: Five articles (5,685 participants) were included in the current meta-analysis. The overall pooled findings using random-effects models among patients with TBI indicated that intravenous administration of cerebrolysin significantly increased Glasgow Outcome Scale score (SMD =0.30; 95% CI: 0.18 to 0.42; $P<0.001$; I^2: 87.8%) and decreased modified Rankin Scale score (SMD =−0.29; 95% CI: −0.42 to 0.16; $P=0.05$; I^2: 89.6%).

Limitations: The results are mainly based on cohort studies and there is a lack of clinical trials in the literature. There is also heterogeneity among the studies regarding the dosage and duration of administration and the measurement of functional outcome.

Conclusion: The results of the current study revealed that intravenous administration of cerebrolysin is associated with improved functional outcome in patients with TBI measured by the Glasgow Outcome Scale and the modified Rankin Scale scores.

Keywords: traumatic brain injury, TBI, cerebrolysin, functional outcome, Glasgow Coma Scale, GOS, modified Rankin Scale, mRS

Introduction

Traumatic brain injury (TBI) is among the most common public health problems in both developed and developing countries being associated with high mortality and morbidity and heavy disease burden in all age groups.[1–3] According to Center for Disease Control, TBI has been responsible for ~2.5 million emergency department

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Original Investigation

Determination of miRNA-199a and its Target Genes in Degenerative Lumbar Intervertebral Disc

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This study has been presented as at the 26th International Student Congress of Bio Medical Sciences (ISCOMS 2019) between 3 and 7 June 2019 at Leiden, Netherlands.

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ABSTRACT

AIM: To determine the expression profile of miRNA-199a-5p in intervertebral disc degeneration (IDD) and its correlation to the grade of IDD.

MATERIAL and METHODS: This case-controlled study was conducted during a 6-month period from 2017 to 2018 in two university hospitals in Shiraz, Iran. We included 15 patients with grade 3 and 4 of Pfirrmann and 5 patients with traumatic lumbosacral fractures with grade I. Total discectomy was performed in all the individuals and the samples were sent to the laboratory. The NP cells were isolated and the RNA was extracted. cDNA was synthesized by reverse transcriptase and the expression was measured using real-time polymerase chain reaction (RT-PCT).

RESULTS: We overall included 20 patients in two study groups. Both study groups were comparable regarding the baseline and clinical characteristics except for age (p=0.026). The fold change (p=0.007) and relative expression (p=0.012) of the miRNA-199a-5p was found to be significantly higher in patients compared to controls. The fold change (p=0.001) and relative expression (p<0.001) were also associated with the Pfirrmann grading. We found that the area under curve (AUC) was 0.880 (95%CI: 0.721-0.938) indicative of moderate accuracy.

CONCLUSION: Expression of the miRNA-199a-5p is increased in the IDD. The expression of the miRNA-199a-5p was also associated with the grade of the degeneration based on the Pfirrmann grading.

KEYWORDS: Intervertebral disc degeneration, MicroRNA-199a, Target genes, Pfirrmann grade

■ INTRODUCTION

Intervertebral disc degeneration (IDD) is currently considered the etiology of low back pain (LBP) which is the second most common complain of the patients referring to the outpatient clinics worldwide (12). LBP is associated with high disease burden and disability worldwide. According to the global burden of the disease, LBP ranked highest in terms of disability (YLDs), and sixth in terms of overall burden (DALYs) with a global prevalence of 9.4% in 2010, increasing with age (6). There are several key steps identified in IDD which includes loss of extracellular matrix, endplate cartilages hyperplasia and subsequent sclerosis, loss of height and release of pro-inflammatory cytokines (19,24). The nucleus pulposus (NP) cells are cartilage-like cells with minimal regenerative potentials which maintain the intervertebral disc function and structure (1). The apoptosis and senescence of the NP cells is considered the key step in IDD and understanding the factors contributing to NP cell apoptosis will shed light on the

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Editorial

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Bulletin of Emergency And Trauma

beat

Neurotrauma as an Evolving Indication for Neuromodulation

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Trauma is a major cause of morbidity and mortality in developing countries. With the advent of life-saving procedures and better inpatient care in trauma-specialized centers in our country, more and more patients are getting their lives back although with residual handicaps, disabilities and pain. Specific therapies must be used to increase quality of life and decrease pain and sufferings in trauma patients, when most of them are young and in their productive ages. Ablative neurosurgical procedures have been used in the past to treat different neurological diseases with significant irreversible side effects. They were useful in controlling pain or improving abnormal movements or behaviors in patients. Recently, many, albeit not all ablative surgeries have been replaced by neuro-stimulative technologies, which can produce the same effects but reversibly, so unwanted complications may be avoided.

Neuromodulation refers to a specific subgroup of minimally invasive procedures aiming to provide therapeutic electrical stimulation to a predesigned field of the nervous system, so the whole system may work more efficiently to reduce pain and movement disorders, and to improve quality of life [1]. Among minimally-invasive procedures, different techniques exist, including deep brain, spinal cord, peripheral nerve and sacral nerve stimulation procedures. Trauma patients have not been an ideal indication for most of these procedures; however, with the advent of newer generation of technologies, trauma is now trying to be re-considered as an evolving indication. Since 2014 we have started different techniques of neuromodulation in Shiraz for various indications. Due to the high rate of trauma patients in the region, traumatic brain and spinal cord injuries are being considered as common indications in our center.

Deep Brain Stimulation (DBS)

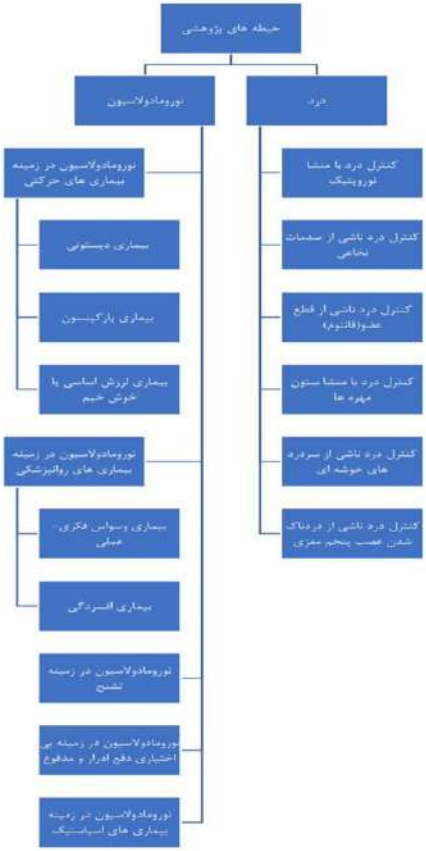
DBS is commonly used in patients with movement disorders (mainly Parkinson's disease, dystonia and tremor) and psychiatric indications. Early reports from the positive effect of deep brain stimulation on patients suffering from severe traumatic brain injury [2] have been promising, and the first prospective study of DBS in these patients has proven its safety and potential effectiveness for functional independence in future [3]. More clinical research is necessary to bring DBS into clinical practice for trauma patients.

Spinal Cord Stimulation (SCS)

Spinal cord or dorsal column stimulation has been used in a variety of different neurological conditions

فراخوان همکاری

این مرکز تحقیقاتی نه تنها به انجام پروژه های بین المللی، داخلی و همکاری با پژوهشگرانی که سابقه قبلی پژوهش دارند پرداخته، بلکه به آموزش افراد علاقمندی که تجربه ای در این زمینه ندارند نیز می پردازد. همکاری با افراد علاقمند صرفا در بحث پژوهشی نبوده و افراد داوطلب می‌توانند در زمینه های فرهنگی، شبکه های اجتماعی و مدیا نیز به فعالیت بپردازند. ما به تمامی افراد علاقمند خوش آمد می گوییم.با توجه به نیاز وجود رویه ای منظم برای جذب دانشجویان و همچنین مشخص بودن نحوه همکاری بادانشجویان، بر آن شدیم تا به توضیح این الگوریتم در مرکز بپردازیم.این مرکز بیش از ده نوع پروسیجر مختلف را در زمینه‌های درد و نورومدولاسیون به انجام می رساند. شرح دقیق این مداخلات در فلوچارت زیر قابل ملاحظه است.



تیم دانشجویی مرکز

هیراد رضایی

امیر رضا بهادری

کامیاب شهریور

سارا مصطفوی

رضا مشفقی نیا

درسا شکوه

امیر حسین سعیدی

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