
بسم الله الرحمن الرحيم

NeuroMaPC

مرکـــز مدولاسیـــون عصبی و درد

حرکت برای زندگی بهتر

مصوب وزارت بهداشت، درمان و آموزش پزشکی

کتابچه معرفی و شرح فعالیتهای سال ۱۳۹۸

پیام ریاست مرکز

بنام خدا

«مرا اختر خفته بیدار گشت به مغز اندر اندیشه بسیار گشت»

بیست سال پیش در حالیکه علم پزشکی در آستانه انقلاب ژنتیک قرار داشت و اطلاعات مربوط به شبیه سازی در صدر اخبار بود، با گروهی از دانشجویان علوم پزشکی و علوم پایه فعالیتی پایه نهاده شد. ده سال بعد صدر اخبار را علوم و فنآوری های چهارگانه (NBIC) اشغال کرده بود و همکاران و موسسین مرکز، در کنار کار بالینی هنوز دلبسته دانش بودند و مشغول آموختن و آموزگاری .
همان روزها ایده تاسیس مرکزی با چشم اندازی یگانه در خدمت به بیماران، محلی برای گرامیداشت دانش و معرفت و انجمنی از دانش پیشگان در ذهن بود و تا امروز همچنان هرچند با گامهای کوتاه اما با استواری در این راه آمده ایم تا میراث بزرگ علم و دانش در ایران را گرامی بداریم و در افزایش سرمایه دانش و زایش دانشمندان جوان سهمی داشته باشیم.
ناگزیر در فرآیند توسعه پژوهش در ایران عزیز، ایده تاسیس مراکز خصوصی مطرح شد و چون معتقد بودیم و هستیم که فرآیند پژوهش و تولید فنآوری باید چابک و هدفمند باشد، با دقت نظر این مدل از همکاری علمی را برگزیدیم .
جمعی از پزشکان متخصص و فوق تخصص در جراحی های اعصاب، بیماری های عصبی، روانپزشکی و توانبخشی در کنار دانش پیشگانی از رشته های گوناگون علوم پایه و مهندسی با پیشنهاد تاسیس اولین مرکز خصوصی در این حوزه گرد هم آمدند. اندک اندک یاران جانی در بخشهای مدیریتی مرکز به ما اضافه شدند. بسیار با هم نشستیم و برخاستیم تا غبار منیت نشست و حجاب زبان از میان برخاست و همزبانی جای خود را به همدلی داد.
آنچه در پیش چشمان نکته سنج شما است انعکاس تصویر بخشی از تلاشهای همکاران مرکز تحقیقات مدولاسیون عصبی و درد است که با سرمایه گران بهای عمر عزیزان همکار و منابع مالی بخش خصوصی در آیینه صفحات منعکس شده، بسیارند تلاشهای مجدانه و مجاهدانه که با عسرت فراوان در حال انجام است و هنوز زمان یسرشان فرا نرسیده و میوه های بسیاری که امید باغبان بر نهال های تازه کاشته اش در ذهن دارد.

ایـکاش دفـتر حـاضر مجالـی بـرای نمایـش کاهـش آلام بیـماران و شـادی ناشـی از بهبـودی و بهـروزی ایشـان داشـت، تـا نتیجـه واقعـی و هـدف اصلـی مرکـز را شـما هـم بـه تماشـا و قضـاوت مـی نشسـتید. همـه تـلاش هـا بـرای ایـن منظـور بـوده و خواهـد بـود و دسـتاوردهای دیگـر فرعنـد بـر ایـن اصـل.
کـثرت همـکاری بـا دانشـمندان رشـته هـای مختلـف در وحـدت مـا و وحـدت مـا در خدمـت بـه کـثرت بیـماران را شـکرگزارم. قدمهـای راسـخ و اسـتوار همـه دانشـمندان و دانـش پیشـگانی کـه بـا مرکـز احسـاس یگانگـی دارنـد در راه کاهـش آلام بیـماران و شـکافتن سـقف فلـک از معرفـت جدیـد، بـر چشـمان ایـن کمتریـن.
حضـور دانشـجویان جوانـی کـه بـا مرکـز مـا همـکاری مـی کننـد، شـیرین تریـن تصویـر و بـرآورده شـدن اولیـن و بزرگتریـن رویـای موسسـین اسـت. بـر همـت ایـن جوانـان عاشـق کـه پـای در راه عشـق بـه علـم نهادنـد بایـد آفریـن هـا گفـت و مرکـز متعهـد خواهـد بـود کـه بیشـترین تـوان خـود را مـصروف همگنـان بیسـت سـال پیـش موسسـین امـروز بگـذارد.

«بی علم تو نتوانی کز پیه کشی روغن بنگر تو در آن علمی کز پیه نظر سازد»

دکتر علی رزم کن
دکتر علیرضا مهدی زاده

درباره ما

عمل جراحی تحریک عمقی مغز DBS بر روی بیمار 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 اعمال جراحی فانکشنال و مدولاسیون عصبی بپردازیم و بررسی ایده های مفید در جهت افزایش بهبودی بیماران 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. مرکز تحقیقات مدولاسیون عصبی و درد، فعالیت رسمی خود را از پاییز سال ۱۳۹۷ آغاز نمود. این مرکز با داشتن حمایت اعضای متخصص در زیرشاخه های متنوع پزشکی، پیراپزشکی و مهندسی سعی بر آن دارد که با اعتماد به محققین و پژوهشگران بتواند گامی موثر در افزایش سطح علمی کشور در زمینه مدولاسیون عصبی و درد، بردارد و خدمات درمانی شایسته ای را در استاندارد بین المللی اما منطبق بر معیارهای بومی ارائه دهد.

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.

پیشه 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.

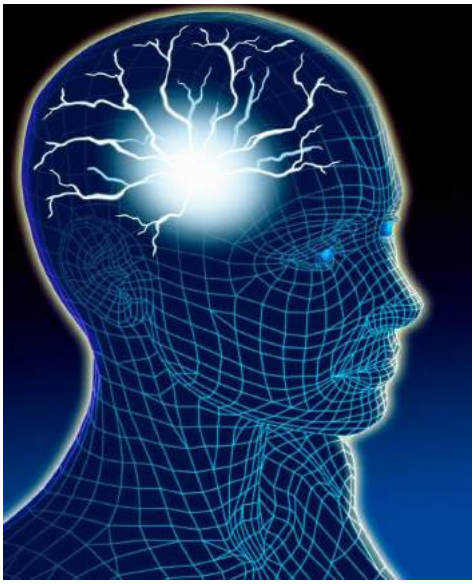
آزمایشات این چنینی بسیاری در طول قرن های اخیر باعث تکامل و پیشرفت فیزیولوژی، نوروساینس، علوم مهندسی و همینطور تکنیک های جراحی؛ در شکل گیری نورومدولاسیون در قالب امروزی بسیار موثر بوده اند.

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 کاربردی‌تر کردن این زمینه ی درمانی داشته است.

پیشرفت ها 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.

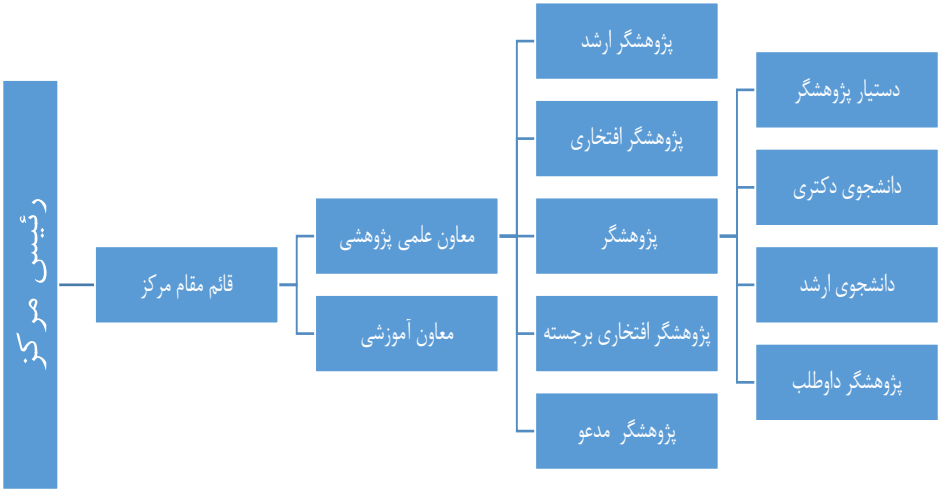
به طور مثال در سال ۲۰۱۰ چیزی حدود ۳ تا ۴/۵ میلیارد دلار در سطح جهان صرف هزینه ی تحقیق،

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.



چارت تشکیلاتی مرکز تحقیقات

ساختار مدیریتی مرکز در نمودار زیر به روشنی تشریح شده است. بخش اعظم نیروهای مرکز را نیروهای پژوهشی تشکیل می دهند.



اعضای مرکز

رئیس مرکز دکتر **علی رزم کُن** جراح مغز و اعصاب، فلوشیپ فانکشنال

قائم مقام دکتر **علیرضا مهدی زاده** دانشیار فیزیک پزشکی

معاون علمی پژوهشی دکتر **فریبرز غفار پسند** جراح مغز و اعصاب

دکتر **راضیه رضایی** متخصص مغز و اعصاب فلوشیپ اختلالات حرکتی

دکتر **بهداد تحیری** دکترای نوروساینس

دکتر **بهمن تحیری** دکترای فیزیک پزشکی

دکتر **نیما درخشان** جراح مغز و اعصاب

دکتر **سید تقی حیدری** دکتری آمار زیستی

دکتر **سید پوریا استاد** متخصص رادیولوژی

اعضای مرکز

دکتر **نژلا مصطفی نژاد** متخصص اعصاب و روان

دکتر **آیدین امیدوار** جراح مغز و اعصاب

دکتر **غلامرضا ودیعی** دستیار تخصصی جراحی مغز و اعصاب

دکتر **امید یوسفی** پزشک عمومی

سعید عبداللهی فرد دانشجوی پزشکی

مهسا پاکرو دانشجوی پزشکی

محمد حسین محمدی کارشناس ارشد مکانیک

مدیر مرکز **سحر مشکسار** دانشجوی دکترای مدیریت کسب و کار

کارشناس پژوهشی **فاطمه خادمی اردکانی** کارشناس ارشد مهندسی پزشکی

میثم حسینی کارشناس فنی

موافقت اصولی مرکز تحقیقات

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

جمهوری اسلامی ایران
وزارت بهداشت، درمان و آموزش پزشکی

دیدگاه
تاریخ: ۱۳۹۸/۴/۲۳

شماره: ۵/۵۰۰/۲۳۱۲
تاریخ: ۱۳۹۸/۰۴/۲۳
پیوست: دارد

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 (خصوصی) تحت نظارت دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شیراز موافقت اصولی بعمل آمد.

دکتر سعید نمکی
وزیر

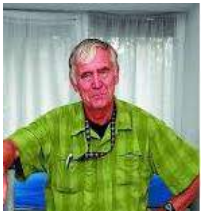
وزارت

رونوشت
- 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 دانشگاه،هاي علوم پزشکي جهت استحضار و دستور اقدام لازم

کدپستی، تهران-شهرک قدس (غرب)-بین فلامک جنوبی و زرافشان-خیابان سیمای ایران-ستاد مرکزی وزارت بهداشت، درمان و آموزش پزشکی
تلفنهای تماس: ۸۱۴۵۵۴۰۱ 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 فانکشنال و استریوتاکتیک
بابت راه اندازی جراحی اختلالات حرکتی در جنوب ایران به شما تبریک می گویم. موفقیت بسیار بزرگی است.



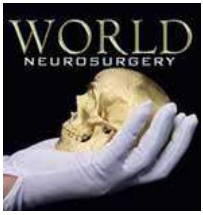
پرفسور Hans Speelman
استاد سابق نورولوژی آمستردام
تبریک به نتایج DBS در شیراز، اثبات کیفیت و استقامت تیم!
Congratulations for the results of DBS in Shiraz: A proof of the quality and endurance of the team.

پروفسور Ludvic Zrinzo
موسسه نورولوژی UCL Queen Square لندن

این واقعا یک دستاورد فوق العاده است. نتایج شگفت انگیز عمل جراحی و مهمتر از آن، 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 تحقیقاتی همکار

۱- مرکز تحقیقات پیر دونیکه، بیمارستان دانشگاهی هانری لابوری در پواتیه، فرانسه

Unite de recherche clinique Pierre Deniker, Centre Hospitalier Henri Laborit, Poitiers

۲- آزمایشگاه ملی نقشه برداری مغز دانشگاه تهران

۳- دبیر خانه ثبت بیماریها و پیامدهای سلامت دانشگاه علوم پزشکی ارومیه

٤- مرکز تحقیقات روانپزشکی و علوم رفتاری دانشگاه علوم پزشکی شیراز

محورهای اصلی فعالیت مرکز تحقیقات مدولاسیون عصبی و درد

۱- خدمات درمانی

اعـمال جراحـی فـوق پیشرفتـه مدولاسـیون عصبـی (اختـلالات حرکتـی، وسـواس جـبری، تشـنج، درد و بـی اختیـاری ادرار)

۲- آموزش تخصصی

ایجـاد فرصـت جهـت متخصصیـن مغـز و اعصـاب و جراحـان مغـز و اعصـاب جهـت یادگیـری در زمینـه مدولاسـیون عصبـی

۳- آموزش پژوهش

آموزش اصول پژوهش به پژوهشگران جوان در جهت اهداف مرکز

٤- آموزش عمومی

آموزش به جامعه در جهت افزایش آگاهی و پیشگیری از بیماری های عصبی

٥- پژوهش های بالینی

طراحـی، مدیریـت و انجـام پژوهـش هـای بالینـی جهـت پایـش و بهبـود کیفیـت درمـان

٦- پژوهش های بنیادی

طراحـی، مدیریـت و انجـام پـروژه هـای بنیـادی و مهندسـی در جهـت بومـی سـازی تکنولـوژی مدولاسـیون عصبـی

عمل جراحی تحریک عمقی مغز

درمـان بیـماری هـای پارکینسـون، دیـس تونـی، لـرزش و برخـی اختـلالات روانپزشـکی همچـون اختـلال وسـواس جـبری توسـط ایـن تکنیـک جراحـی امـکان پذیـر مـی باشـد. شـیراز یـک مرکـز منحـصر بفـرد انجـام ایـن عمـل جراحـی در منطقـه مـی باشـد.

عمل جراحی کارگذاری محرک نخاعی

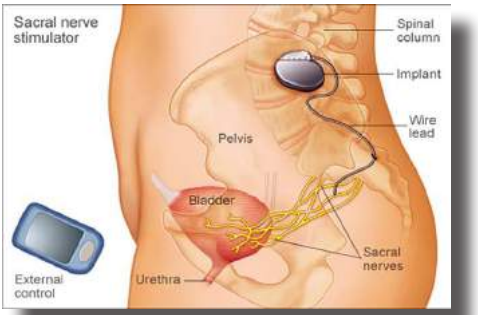
ایـن عمـل جراحـی جهـت بیمارانـی کـه قبـلا تحـت عمـل جراحـی سـتون فقـرات قـرار گرفتـه انـد و مبتـلا بـه درد شـدید سوزشـی در اندامهـا مـی باشـند، و یـا بیـماران دیابتـی بـا چنیـن دردی مفیـد مـی باشـد.

کارگذاری پمپ های نخاعی

بیـماران مبتـلا بـه درد شـدید اندامهـای بـدن، خصوصـا بـه دنبـال بدخیمـی یـا آسـیبهای نخاعـی، کاندید مناسـبی بـرای کارگـذاری ایـن تکنولـوژی پیشرفتـه هسـتند.

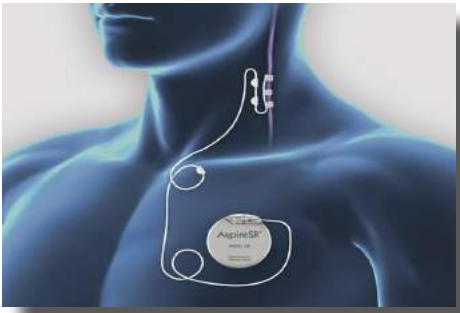
کارگذاری محرک عصب خاجی

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



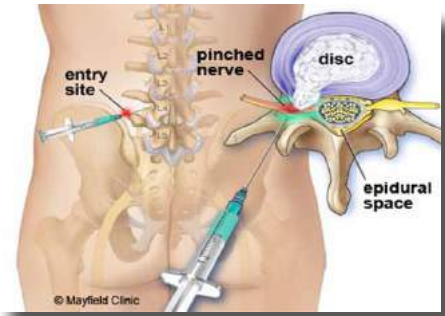
اعمال جراحی جهت صرع

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 می باشند و به درمانهای محافظه کارانه پاسخ ندهند، می توانند از پیشرفته ترین درمانهای کم تهاجمی درد بهره جویند.



مرکـز مدولاسـیون عصبـی و درد از ابتـدای تاسـیس تـا کنـون، آمـوزش تحقیـق و همچنیـن تعلیـم افـراد علاقـه منـد در حیطـه ی مدولاسـیون عصبـی را جـز اهـداف خـود دانسـته و از ایـن رو تـا کنـون بـا برگـزاری کنفرانـس هـای علمـی، سـعی در تعلیـم پژوهشـگران علاقمنـد داشـته اسـت.

در هـر یـک از جلسـات ایـن کنفرانـس هـای علمـی یکـی از ابعـاد نورومدولاسـیون ارائـه شـدند و علاقمنـدان بـه ایـن حیطـه در ایـن کنفرانـس هـا شرکـت کـرده انـد. مباحـث مطـرح شـده در ایـن کنفرانـس هـا، تـا کنـون زمینـه هـای مطـرح شـدن و ادامـه یافـتن بسـیاری از طـرح هـای پژوهشـی مرکـز شـده انـد.

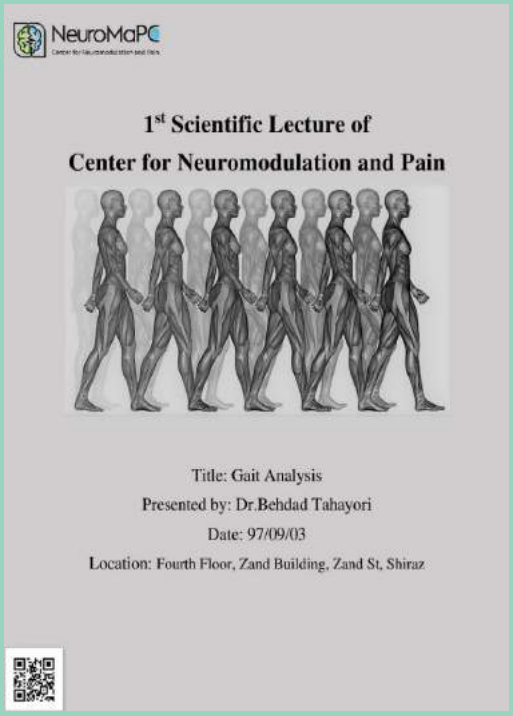
اولین جلسه

موضوع Gait Analysis

ارائه دهنده : دکتر بهداد تحیری

به تاریخ ۹۷/۰۹/۰۳

در ایـن جلسـه دکـتر تحیـری، دکـترای نوروسـاینس، پیرامـون مشـکلات راه رفـتن در بیـماران پارکینسـونی و نحـوه ی بررسـی و بهبـود شرایـط بیـماران بـه توضیـح پرداختنـد.



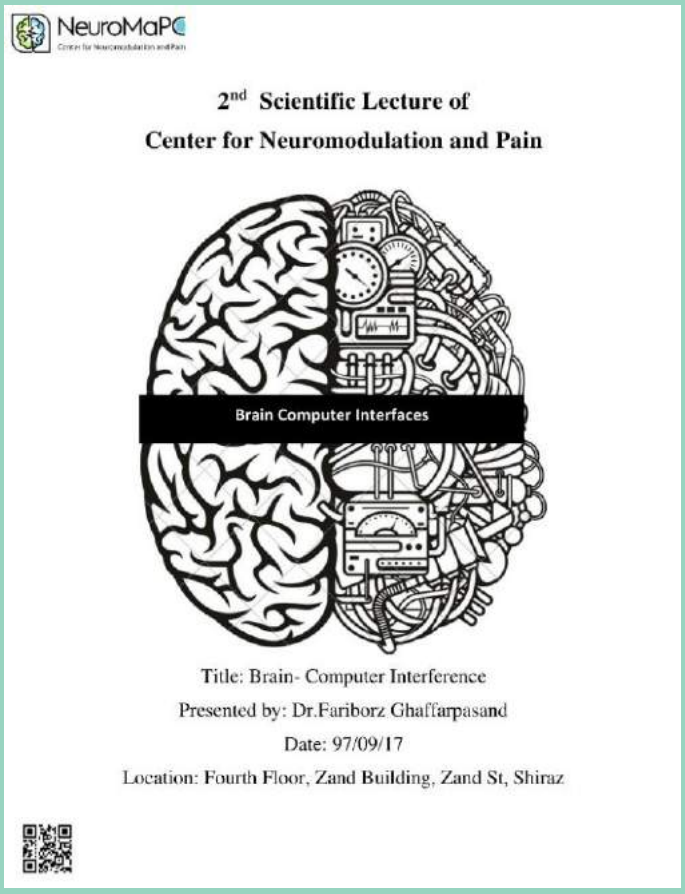
دومین جلسه

موضوع Brain Computer Interference

ارائه دهنده : دکتر فریبرز غفار پسند

به تاریخ ۹۷/۰۹/۱۷

در این جلسه دکتر فریبرز غفار پسند، جراح مغز و اعصاب، به موضوع جذاب راه های ارتباطی مغز و کامپیوتر پرداختند.



سومین جلسه

موضوع Electromagnetic Field Effects on Neuromodulation and Pain

ارائه دهنده : دکتر علیرضا مهدی زاده

به تاریخ ۹۷/۱۰/۰۵

در ایـن جلسـه دکـتر علیرضـا مهـدی زاده، دکـترای فیزیـک پزشـکی، در مـورد کاربـرد الکترومغناطیـس در حیطـه ی نورومدولاسـیون پرداختنـد.

NeuroMaPC
Center for Neuromodulation and Pain

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

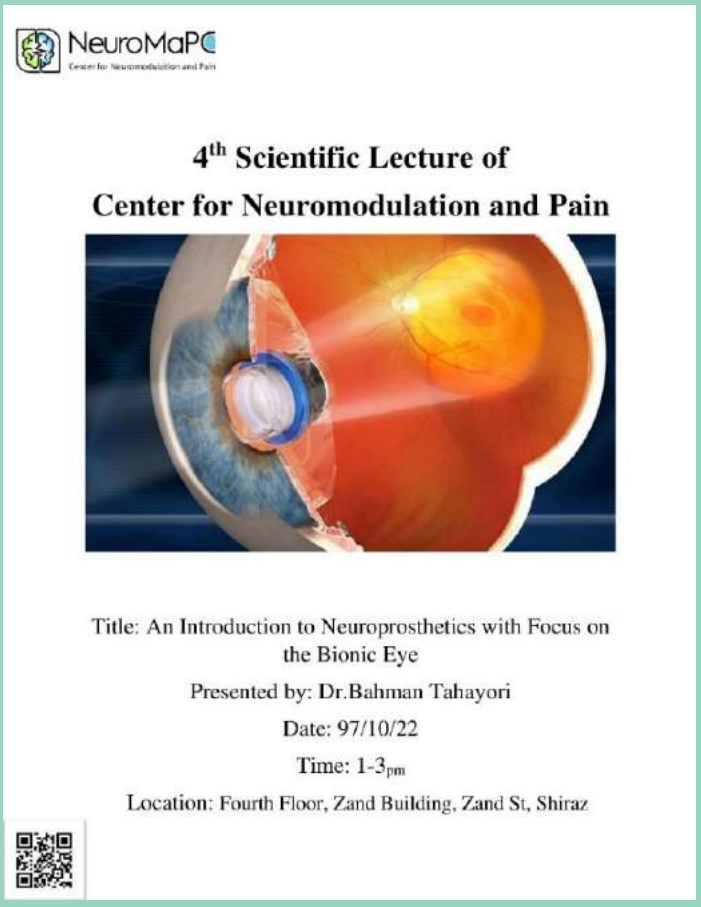
چهارمین جلسه

موضوع An Introduction to Neuroprosthetics with Focus on the Bionic Eye

ارائه دهنده : دکتر بهمن تحیری

به تاریخ ۹۷/۱۰/۲۲

در ایـن جلسـه دکـتر بهممـن تحیـری، دکـترای فیزیـک پزشـکی، در مـورد آخریـن تحقیقـات در مـورد چشـم بیونیـک توضیـح دادنـد.



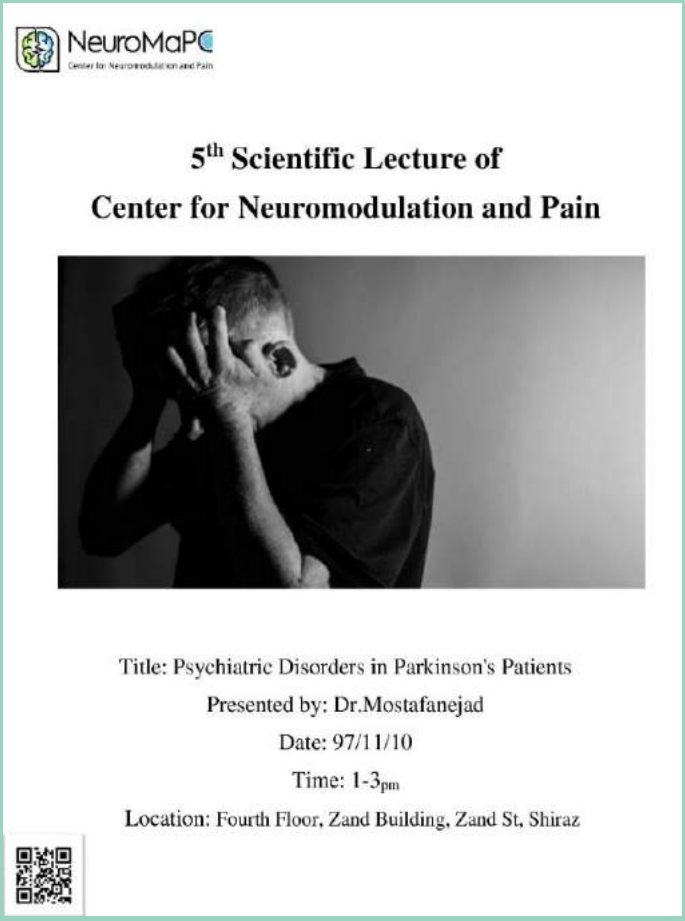
پنجمین جلسه

موضوع Psychiatric Disorders in Parkinson's Disease

ارائه دهنده : دکتر نژلا مصطفی نژاد

به تاریخ ۹۷/۱۱/۱۰

در ایـن جلسـه دکـتر نـژلا مصطفـی نـژاد، متخصـص روانپزشـکی، بـه توضیـح در مـورد مشـکلات شـایع روانپزشـکی در میـان بیـماران مبتـلا بـه پارکینسـون پرداختنـد.



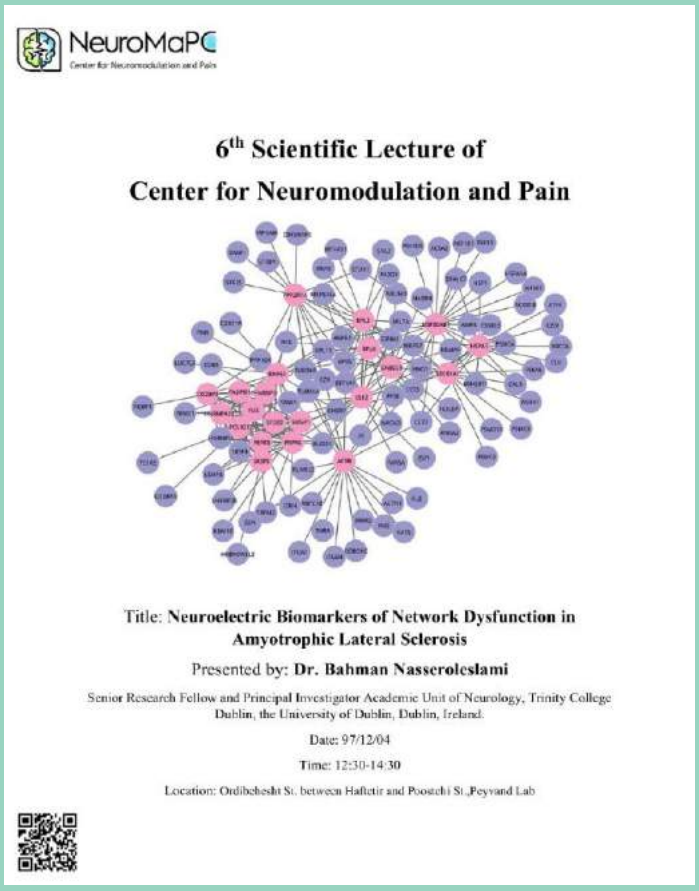
ششمین جلسه

موضوع Neuroelectric Biomarkers of Network Dysfunction in AML

ارائه دهنده: دکتر بهمن ناصر الاسلامی

به تاریخ ۹۷/۱۲/۰۴

در ایـن جلسـه دکـتر ناصرالاسـلامی، دکـترای فیزیـک پزشـکی، در یـک تلـه کنفرانـس از دوبلیـن، بـه تغییـرات شـبکه هـای عصبـی در بیـماری MS پرداختنـد.



هفتمین جلسه

موضوع Deep Brain Stimulation

ارائه دهنده : دکتر امید یوسفی

به تاریخ ۹۸/۱۰/۱۸

در ایـن جلسـه، دکـتر امیـد یوسـفی از پژوهشـگران مرکـز، در مـورد عمـل جراحـی DBS در بیـماران پارکینسـونی توضیحاتـی ارائـه دادنـد.

هشتمین جلسه

موضوع Neuromodulation

ارائه دهنده : دکتر علی رزم کُن

به تاریخ ۹۸/۱۱/۲۸

در ایـن جلسـه دکـتر رزم کُـن، رییـس مرکـز، در مـورد انـواع حیطـه هـای مدولاسـیون عصبـی و کاربرد های آنها توضیحاتی ارائه کردند.

کارگاه:

یکی دیگر از اهداف مرکز مدولاسیون عصبی و درد، تعلیم نیروی متخصص برای ارائه ی بهتر درمان به بیماران نیازمند میباشد. از این رو جلسات آموزشی مرکز در جهت گسترش این هدف، در طی دو سال گذشته دایر بوده و برنامه ریزی ها جهت پیشبرد سریع تر این موضوع از اولویت های مرکز است.

جلسه ی آشنایی و آموزش تحریک عمقی مغز برای متخصصین نورولوژیست و جراحان مغز که در تاریخ ۱۳۹۸/۰۷/۱۲ به میزبانی آزمایشگاه پیوند برگزار شد. در این جلسه دکتر رزم کُن و دکتر رضایی، جراح و نورولوژیست تیم تحریک عمقی مغز، به توضیح در مورد مراحل جراحی بیماران پارکینسونی پرداختند و در ادامه، دکتر وایدیاناتان، سخنران بین المللی مدعو نیز به جزئیات تکمیلی اشاره کردند.

کارگاه:

در یکی دیگر از این جلسات آموزشی، برای پایش بهتر و همچنین کمک به بیماران پارکینسونی که افکار و یا تمایلاتی نسبت به خودکشی دارند، دکتر سارا پاشنگ پژوهشگر مهمان از دانشگاه پوآتیه فرانسه در مورد چگونگی استفاده از ابزارهای نوین سنجش تمایل به خودکشی در بیماران، به توضیح پرداختند.

کنفرانس یک روزه کاربردهای تحریک عصب واگ VNS در درمان صرع و افسردگی

کنفرانس یک روزه کاربردهای تحریک عصب واگ VNS در درمان صرع و افسردگی با همکاری بخش نورولوژی، روانپزشکی و جراحی اعصاب دانشگاه علوم پزشکی شیراز، پنج شنبه پنجم دی ۹۸ در تالار اقبال لاهوری بیمارستان نمازی با حضور اساتید و متخصصان و جراحان مغز و اعصاب برگزار شد. در این سمینار، دکتر علی رزم کُن جراح و متخصص مغز و اعصاب و رئیس مرکز مدولاسیون عصبی و درد به ارایه سخنرانی در باب تکنیک جراحی VNS پرداخت.

جلسه دفاع نخستین پایان نامه تخصصی انجام شده در مرکز

جلسه دفاع از پایان نامه تخصص روانپزشکی سوم اسفندماه ۹۸ توسط خانم دکتر مصطفی نژاد که نخستین پایان نامه مشترک دانشگاه با مرکز تحقیقات مدولاسیون عصبی به شمار می آید. این پژوهش حاوی نتایج بسیار جذاب و مهمی شامل بهبود علایم افسردگی و اضطراب و تکانشی در بیماران پس از روشن شدن دستگاه می باشد. در این جلسه، پروفسور جعفری از بزرگترین روانپزشکان فرانسه و اروپا در زمینه جراحی اختلالات روانی از طرف مرکز نورومدولاسیون شیراز حضور داشتند. از راست به چپ: دکتر مانی، دکتر دستغیب، پروفسور جعفری، استاد جوادپور، خانم دکتر مصطفی نژاد، دکتر رزم کُن و دکتر مولا.

پایان نامه های انجام شده با حمایت مرکز

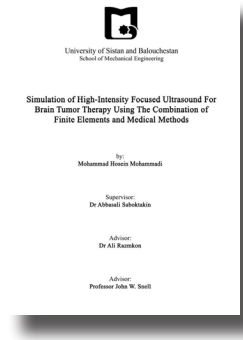
فریده مؤمنی

دکتر امید یوسفی

دکتر نژلا مصطفی نژاد

پایان نامه های در دست انجام

دکتر لیلا کلهر



محمد حسین محمدی

دکتر سمانه خضرایی

جایزه محقق برتر جشنواره رازی

جایزه بهترین پژوهش دانشجویی کنگره جراحان مغز آمریکا

بیشترین تعداد داوری انجام شده توسط یک داور در یکی از مجلات Elsevier

پایگاه داده آنلاین مرکز

مرکز تحقیقات مدولاسیون عصبی و درد در راستای انجام و هدایت پروژه های بزرگ پژوهشی در زمینه مدولاسیون عصبی اقدام به تاسیس دو پایگاه داده آنلاین و جامع نموده تا با اعطای دسترسی به پژوهشگران علاقه‌مند به حیطه نورو مدولاسیون، زمینه‌ساز اجرای پروژه‌های پژوهشی متعدد در این زمینه گردد.

۱. پایگاه داده‌های بیمارانی که تحت عمل DBS قرار گرفته اند:
شامل اطلاعات دموگرافیک، فیلم ها و پارامتر های تحریکی و تغییرات این پارامتر ها، قبل و بعد از عمل کلیه بیمارانی است که به دلیل پارکینسون، وسواس و دیستونی تحت عمل جراحی قرار گرفته اند. امکان آنالیز کوچک ترین موارد نیز بنا بر درخواست ممکن می باشد.

۲. پایگاه داده بیماران پارکینسونی:
با توجه به این که جراحی پارکینسون انحصارا در در این مرکز انجام می گیرد، ماهانه ۲۰۰ بیمار از سراسر کشور و حتی خارج از کشور به این مرکز مراجعه می کنند که تمامی بیماران به محض ورود توسط نورولوژیست و روانپزشک، روانشناس و سایر متخصصین مرتبط ویزیت می شوند و فرم های اختصاصی بیماران تکمیل می شود و اطلاعات آن ها با رضایت آگاهانه بیماران در این پایگاه داده ثبت می گردد که منبع بسیار خوبی برای پژوهشگران است. آنلاین بودن این پایگاه های داده این امکان را به پژوهشگران خواهد داد تا بتوانند در هر کجای کره خاکی که هستند از این اطلاعات استفاده نمایند.

الف: مطالعات تهاجمی مغز

مطالعـات تهاجمـی بـرای بیـماری هـای حرکتـی: بـا توجـه بـه ناتوانـی دارو درمانـی در درمـان مراحـل پیشرفتـه بیـماری هـای حرکتـی همچـون پارکینسـون و دیسـتونی، ایـن مرکـز در راسـتای بهبـود کیفیـت زندگـی ایـن بیـماران همـواره در حـال مطالعـه بـر روی DBS و پارامـتر هـای آن و تاثیـر ایـن تغییـرات بـر روی مـواردی همچـون Gait و عـوارض غیـر موتـور ایـن بیـماران میباشـد. مطالعـه ای در مـورد کیـس هـای عمـل شـده پارکینسـونی تاکنـون چـاپ گردیـده و تعـداد ۶ مطالعـه نیـز در حـال چـاپ یـا انجـام میباشـد.

مطالعـات تهاجمـی بـرای بیـماری هـای روانپزشـکی: ایـن مرکـز از پیشـگامان Psychosurgery در منطقـه بـوده و ۴ مقالـه از بیـماران عمـل شـده و سـایر موضوعـات در ایـن حیطـه در حـال چـاپ و انجـام میباشـد.

ب: مطالعات غیر تهاجمی مغز

مطالعـات غیـر تهاجمـی بـرای بیـماری هـای حرکتـی و سـایر ناتوانـی هـای جسـمی: بـه علـت تهاجمـی بـودن DBS، هزینـه زیـاد ایـن عمـل هـا، مناسـب نبـودن بعضـی از بیـماران بـرای تحریـک عمقـی مغـز و همچنیـن مطالعـات جدیـد بـر روی روش هـای غیـر تهاجمـی تحریـک مغـز ایـن مرکـز نیـز بـر روی ایـن دسـته از مداخـلات در حـال مطالعـه اسـت. بررسـی تحریـکات سـطحی در بیـماران تروماـی مغـزی و پارکینسـونی از جملـه ای تحقیقـات اسـت. ۲ مطالعـه در مرکـز در حـال انجـام اسـت.

مطالعـات غیـر تهاجمـی بـرای بیـماری هـای روانپزشـکی: بنابـر دلایـل گفتـه شـده بـرای مطالعـه بـر روی مداخـلات غیـر تهاجمـی مغـز بـر روی بیـماران حرکتـی، مطالعاتـی نیـز بـر روی بیـماران بیـماری هـای روانپزشـکی بـه صـورت تحریـکات سـطحی در حـال انجـام اسـت.

ج: مطالعات مربوط به حیطه تصویر برداری

بـا توجـه بـه نیـاز روز افـزون مرکـز بـرای بهبـود کیفیـت و تصویـر بـرداری بهـتر بـرای اسـتفاده در مداخـلات تهاجمـی، مرکـز در حـال مطالعـه روش هـای جدیـد تصویـر بـرداری و اسـکن هسـته ای در بیـماران بـه کمـک گـروه هـای فیزیـک پزشـکی، پزشـکی هسـته ای و رادیـو لـوژی اسـت. در ایـن دسـته نیـز ۴ مطالعـه در حـال انجـام میباشـد.

گروه دانشجویی مرکز تحقیقات

هماهنگ کننده: سعید عبداللهی فرد


مبینا امیرسلیمانی


امیر بهادری


هیراد رضاعی


امیرحسین سعیدی


زهرا شریفی


کامیاب شهریور


کیوان صاحبی


عرفان طاهری


حسن فروزند


مرضیه کرمی راد


حمیدرضا محقق


علی سینا میرزایی


احمد هاشمی

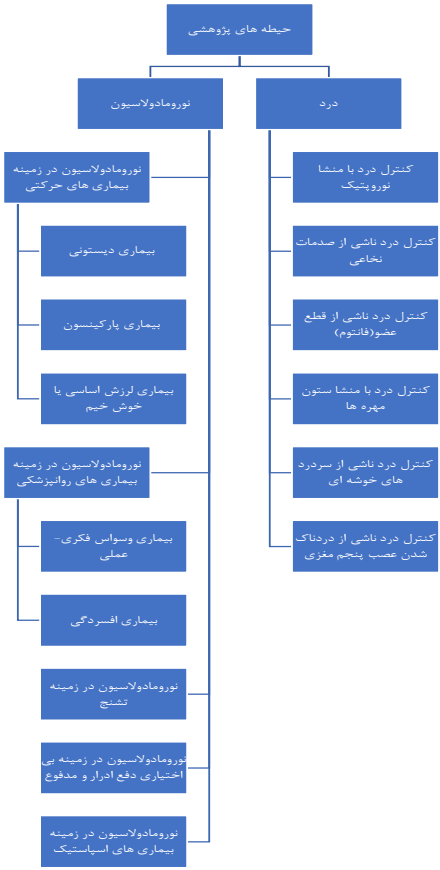

علیرضا هنر


هومان کامران

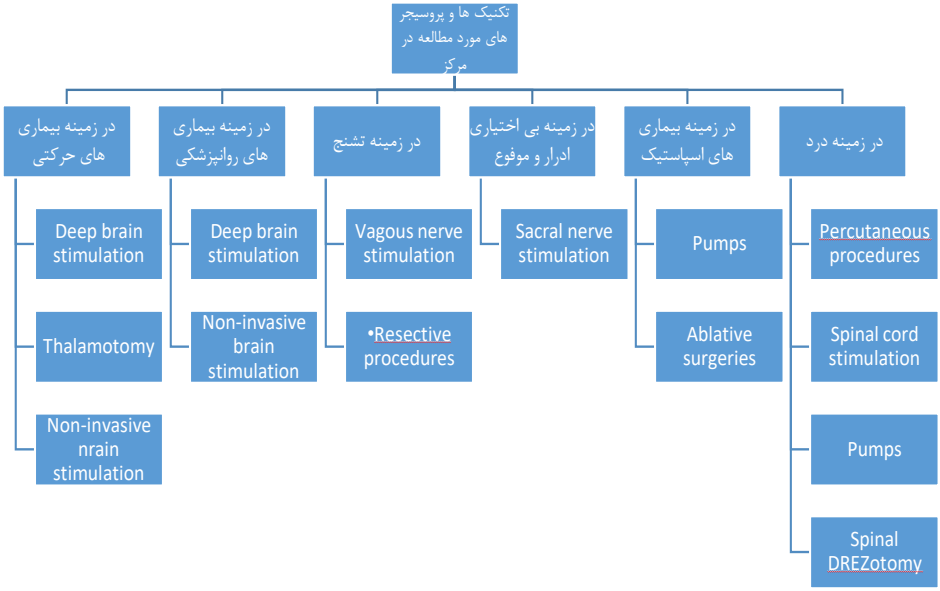
دانشجو و پژوهشگر گرامی

ایـن مرکـز تحقیقاتـی نـه تنهـا بـه انجـام پـروژه هـای بیـن المللـی، داخلـی و همـکاری بـا پژوهشـگرانی کـه سـابقه قبلـی پژوهـش دارنـد پرداختـه، بلکـه بـه آمـوزش افـراد علاقـه منـدی کـه تجربـه ای در ایـن زمینـه ندارنـد نیـز مـی پـردازد. همـکاری بـا افـراد علاقـه منـد صرفـا در بحـث پژوهشـی نبـوده و افـراد داوطلـب میتواننـد در زمینـه هـای فرهنگـی، شـبکه هـای اجتماعـی و مدیـا نیـز بـه فعالیـت بپردازنـد. مـا بـه تمامـی افـراد علاقـه منـد خـوش آمـد مـی گوییـم.

بـا توجـه بـه نیـاز وجـود رویـه ای منظـم بـرای جـذب دانشـجویان و همچنیـن مشـخص بـودن نحـوه همـکاری بـا دانشـجویان، بـر آن شـدیم تـا بـه توضیـح ایـن الگوریتـم در مرکـز بپردازیـم. پیـش از اینکـه بـه توضیـح ایـن رویـه بپردازیـم، حیطـه هـای پژوهشـی ایـن مرکـز را مـرور میکنیـم.



ایـن مرکـز مفتخـر اسـت کـه بیـش از ده نـوع پروسـیجر مختلـف را در زمینـه هـای درد و نورومدولاسـیون بـه انجـام مـی رسـاند. شرح دقیـق ایـن مداخـلات در فلوچـارت زیـر قابـل ملاحظـه اسـت.



نحوه همکاری با پژوهشگران و علاقه مندان

افراد داوطلب می توانند از طریق آدرس ایمیل زیر:

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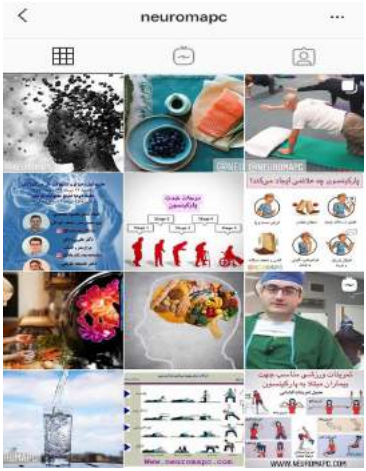
درخواست همکاری خود را اعلام نمایند. رزومه شما ظرف مدت دو هفته بررسی شده و از شما برای مصاحبه دعوت بعمل خواهد آمد. پس از مصاحبه و بررسی رزومه هر فرد، افرادی که سابقه پژوهش های قبلی را داشته باشند و در مصاحبه قبول شوند، Interest group های مرکز به آن ها معرفی شده و یا به طور مستقل به فعالیت پژوهشی خواهند پرداخت یا به پروژه های قبلی اضافه میگردند. افرادی که سابقه فعالیت پژوهشی ندارند مصاحبه شده و در صورت قبولی در مصاحبه دو هفته فرصت خواهند داشت تا اولین پروژه خود را در مرکز انجام دهند. سپس در نزدیک ترین دوره آموزشی مرکز (NEUROMAPC Research School) شرکت خواهند کرد. پس از اتمام این دوره آموزشی Interest group های مرکز به آن ها معرفی شده و یا به طور مستقل به فعالیت پژوهشی خواهند پرداخت یا به پروژه های قبلی اضافه میگردند.

در صورت هرگونه سوال در مورد روند فوق و یا نحوه همکاری غیرپژوهشی با مرکز، داوطلبان میتوانند با ایمیل فوق در ارتباط باشند.

یکی دیگر از اهداف ٦ 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 سریع تر بیماری و کمک به افراد مبتلا، کمک شایانی میکند.

از این رو مرکز مدولاسیون عصبی و درد در طی دو سال گذشته، همزمان با ماه و روز جهانی آگاهی از پارکینسون، وظیفه ی خود دانسته که در جهت افزایش آگاهی مردم کشور در مورد بیماری پارکینسون تلاش کند.

در فروردین سال ۱۳۹۸ جلسه ای به میزبانی بیمارستان کوثر شیراز، با حضور فرهیختگان علمی و همچنین تعدادی از مبتلایان به بیماری پارکینسون و خانواده های این عزیزان برگزار شد. اما در سال ۱۳۹۹، با توجه به پاندمی ویروس کرونا، تصمیم بر استفاده از ظرفیت شبکه های مجازی گرفته شد و در طی هفته ی آگاهی از بیماری پارکینسون، روزانه مطالبی علمی به اشتراک گذاشته می شد.



در کنار تلاش مستمر در آموزش تخصصی به پژوهشگران، متخصصین و دانشجویان رشته‌های 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.

عنوان مقاله	نویسندگان	مجله	مهم ترین نمایه ها	IF (JCR-2016)
Using Preimplanted Deep Brain Stimulation Electrodes for Rescue Thalamotomy in a Case of Holmes Tremor: A Case Report and Review of the Literature	Ali Razmkon, Omid Yousefi, Janardan Vaidyanathan	Stereotactic and Functional Neurosurgery	ISI, Scopus, PubMed, Embase	1.49
Initial Results of Bilateral Subthalamic Nucleus Stimulation for Parkinson Disease in a Newly Established Center in a Developing Country: Shiraz, Southern Iran	Ali Razmkon, Omid Yousefi, , Janardan .Vaidyanathan, et al	World neurosurgery	ISI, Scopus, PubMed, Embase	1.570
Neurotrauma as an Evolving Indication for Neuromodulation	Ali Razmkon	Bulletin of Emergency & Trauma	PubMed, Embase	2.139
Exercise induced operant conditioning of the H-reflex in stroke patients: Hopes for improving motor function through inducing plastic changes in the spinal pathways.	Behdad Tahayori* and David Koceja	Journal of Neurology, Neurological Science and Disorders	ISI, Scopus, PubMed,	
Effects of cerebrolysin on functional outcome of patients with traumatic brain injury: a systematic review and meta-analysis	Fariborz Ghaffarpasand, et al.	Neuropsychiatric Disease and Treatment Vols. 1 to 16; 2005 to 2020	ISI, Scopus, PubMed, Embase, DOAJ	2.157
Intravenous Acetaminophen (Paracetamol) for Postcraniotomy Pain: Systematic Review and Meta-Analysis of Randomized Controlled Trials	Fariborz Ghaffarpasand, et al.	World neurosurgery	ISI, Scopus, PubMed, Embase	1.570
Determinants of reoperation after decompressive craniectomy in patients with traumatic brain injury: A comparative study	Fariborz Ghaffarpasand, et al.	Clinical neurology and neurosurgery	ISI, Scopus, PubMed, Embase	0.46
Tranexamic Acid; A Glittering Player in the Field of Trauma	Fariborz Ghaffarpasand, et al.	Bulletin of Emergency & Trauma	PubMed, Embase	2.139
Risk Factors of Neural Tube Defects in a Sample of Iranian Population from Southern Iran; a Hospital-Based Investigation	Fariborz Ghaffarpasand, et al.	The Iranian Journal of Neurosurgery (Iran. J. Neurosurg)	DOAJ	

عنوان مقاله	نویسندگان	مجله	مهم ترین نمایه ها	IF (JCR-2016)
Ventrolateral Preoptic Nucleus of Hypothalamus; A Possible Target for Deep Brain Stimulation for Treatment of Sexual Dysfunction	Fariborz Ghaffarpasand, et al.	The Iranian Journal of Neurosurgery (Iran. J. Neurosurg)	DOAJ	
MicroRNA-199a Upregulation Mediates Lumbar Intervertebral Disc Degeneration and is Associated with Clinical Grades of Degeneration	Fariborz Ghaffarpasand, et al.	Turkish neurosurgery (TURK NEUROSURG)	ISI, Scopus, PubMed	0.25
Determination of miRNA-199a and its Target Genes in Degenerative Lumbar Intervertebral Disc	Fariborz Ghaffarpasand, et al.	Turkish neurosurgery (TURK NEUROSURG)	ISI, Scopus, PubMed	0.25
Clinical outcome of V-Y flap with latissimus dorsi and gluteal advancement for treatment of large thoracolumbar myelomeningocele defects: a comparative study	Fariborz Ghaffarpasand, et al.	Journal of neurosurgery	ISI, Scopus, PubMed, Embase	3.630
In Reply to “Noncoding Ribonucleic Acid Studies of Lumbar Disk Disease: Decade Retrospect”	Fariborz Ghaffarpasand, et al.	World neurosurgery	ISI, Scopus, PubMed, Embase	1.570
MicroRNA Expression Profiles, Target Genes, and Pathways in Intervertebral Disk Degeneration: A Meta-Analysis of 3 Microarray Studies	Fariborz Ghaffarpasand, et al.	World neurosurgery	ISI, Scopus, PubMed, Embase	1.570
Review of Renal Biopsies, A Single Center Experience	Omid Yousefi, et al.	Iranian Journal of Kidney Diseases		1.150
Determinants of reoperation after decompressive craniectomy in patients with traumatic brain injury: A comparative study	Fariborz Ghaffarpasand, et al.	Clinical neurology and neurosurgery	ISI, Scopus, PubMed, Embase	0.46

Case Report

Stereotactic and Functional Neurosurgery

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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

Ali Razmkon[a] Omid Yousefi[a] Janardan Vaidyanathan[b]

[a]Research Center for Neuromodulation and Pain, Shiraz, Iran; [b]Medtronic, Mumbai, India

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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karger@karger.com
www.karger.com/sfn

Ali Razmkon, MD, Functional Neurosurgeon
Research Center for Neuromodulation and Pain
P.O. Box 71455-166
Shiraz (Iran)
ali.razmkon@gmail.com

ORIGINAL ARTICLE

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

Ali Razmkon[1], Omid Yousefi[1], Raziyeh Rezaei[1], Sina Salehi[2], Peyman Petramfar[3], Arash Mani[4], Hashem Rahmati[5], Janardan Vaidyanathan[6], Ghazal Ilami[1], Yalda Amirmoezzi[1]

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 60% reduction) was observed. The mean improvement was 40% in UPDRS II and 67% 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.[6–8] 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.[13]

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.[14] 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 285 per 100,000 population in Iran, which is considered a medium-to-high rate.[14,15] 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

From the [1]Research Center for Neuromodulation and Pain, Khorshid Hospital, Shiraz; [2]Shiraz Neuroscience Research Center, [3]Department of Neurology, [4]Research Center for Psychiatry and Behavioral Sciences, and [5]Community-based Psychiatric Care Research Center, Shiraz University of Medical Sciences, Shiraz, Iran; and [6]Medtronic, Mumbai, India

To whom correspondence should be addressed: Ali Razmkon, M.D. [E-mail: ali.razmkon@gmail.com]

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Editorial

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Bulletin of Emergency And Trauma

beat

Neurotrauma as an Evolving Indication for Neuromodulation

***Ali Razmkon*[1*]**

[1]*Center for Neuromodulation and Pain, Health Technology Research Center, Kowsar Hospital, Shiraz, Iran*

[*]***Corresponding author:*** *Ali Razmkon*
Address: Center for Neuromodulation and Pain, Health Technology Research Center, Kowsar Hospital, Shiraz, Iran.
Tel: +98-917-3148711
e-mail: ali.razmkon@gmail.com

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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 colmn stimulation has been used in a variety of different neurological conditions

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Behdad Tahayori[1]* and David Koceja[2]

[1]Department of Kinesiology and Program in Neurosciences, Research Center for neuromodulation and pain, Indiana University Bloomington, USA

[2]Department of Kinesiology and Program in Neurosciences, Indiana University Bloomington, USA

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***Corresponding author:** Behdad Tahayori, Department of Kinesiology, Indiana University Bloomington, USA, E-mail: **btahayor@indiana.edu**

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 humancomputer 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 %80.1±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 Hreflex 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

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Neuropsychiatric Disease and Treatment

Fariborz Ghaffarpasand[1]
Saeed Torabi[2]
Ali Rasti[3]
Mohammad Hadi Niakan[4]
Sara Aghabaklou[5]
Fatemeh Pakzad[6]
Maryam Sadat Beheshtian[7]
Reza Tabrizi[8]

[1]Research Center for Neuromodulation and Pain, Shiraz University of Medical Sciences, Shiraz, Iran; [2]Department of Anesthesiology and Intensive Care Medicine, University Hospital of Cologne, Cologne, Germany; [3]Poostchi Ophthalmology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran; [4]Trauma Research Center, Rajaei Trauma Hospital, Shiraz University of Medical Sciences, Shiraz, Iran; [5]Department of Neurosurgery, Tehran University of Medical Sciences, Tehran, Iran; [6]Department of Anesthesiology, Shiraz University of Medical Sciences, Shiraz, Iran; [7]Department of Neurosurgery, Shahid Beheshti University of Medical Sciences, Tehran, Iran; [8]Health Policy Research Center, Institute of Health, Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

Correspondence: Mohammad Hadi Niakan
Trauma Research Center, Rajaei Trauma Hospital, Shiraz University of Medical Sciences, 6th Floor, Chamran Avenue, Shiraz 4818684668, Iran
Tel +98 921 670 7983
Email hadiniakan@yahoo.com

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.[1,2] According to Center for Disease Control, TBI has been responsible for ~2.5 million emergency department

LITERATURE REVIEW

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

Fariborz Ghaffarpasand[1], Ehsan Dadgostar[4], Ghazal Ilami[1], Fatemeh Shoaee[8], Amin Niakan[2], Sara Aghabaklou[5], Maryam Ghadimi[6], Sogand Goudarzi[7], Maryam Dehghankhalili[3], Mohammad Hesam Alavi[2]

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

From the [1]Research Center for Neuromodulation and Pain, [2]Trauma Research Center, and [3]Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran; [4]Halal Research Center of IRI, Food and Drug Administration, Tehran, Iran; [5]Department of Preventive Medicine, University of Southern California, Los Angeles, California, USA; [6]Department of Radiology, Johns Hopkins University, Baltimore, Maryland, USA; [7]Division of Cardiovascular Medicine, Department of Medicine, Beth Israel Deaconess Medical School, Harvard University, Boston, Massachusetts, USA; and [8]Department of Obstetrics and Gynecology, Shiraz Kowsar Hospital, Shiraz, Iran

To whom correspondence should be addressed: Amin Niakan, M.D.
E-mail: aminniakan@yahoo.com; aniakan@sums.ac.ir

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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 69% and 87%.[4,5] Although there is an international consensus regarding optimal postcraniotomy pain control, there is great controversy in treatment options and medical choices.[1,6,7] Opioids have been shown to provide appropriate pain control after craniotomy; however, there 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).[8]

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 intertationally 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 tested in limited studies, among which there are only some randomized controlled trials (RCTs), with

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

Hosseinali Khalili[a], Fariborz Ghaffarpasand[b,*], Amin Niakan[a], Nasim Golestani[c], Iman Ahrari[d], Hamid Reza Abbasi[c], Ali Rasti[e]

[a] Trauma Research Center, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
[b] Research Center for Neuromodulation and Pain, Shiraz University of Medical Sciences, Zand Avenue, Shiraz, Iran
[c] Trauma Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[d] Student Research Committee, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
[e] Poostchi Ophthalmology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

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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 INR 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 evacuatable 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

* Corresponding author at: Research Center for Neuromodulation and Pain, Zand Avenue, PO Box: 71455-166, Shiraz, Iran.
E-mail addresses: khalilih16@gmail.com (H. Khalili), ghafarf@sums.ac.ir (F. Ghaffarpasand), aniakan@sums.ac.ir (A. Niakan), nasimg_499@yahoo.com (N. Golestani), imanahrari@gmail.com (I. Ahrari), abbasimezy@yahoo.com (H.R. Abbasi), rastialirasti@gmail.com (A. Rasti).

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Editorial

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Tranexamic Acid; A Glittering Player in the Field of Trauma

Fariborz Ghaffarpasand*[1,2], *Hamid Reza Abbasi*[2], *Shahram Bolandparvaz*[2], *Shahram Paydar*[2], *Maryam Dehghankhalili*[3]

[1]*Research Center for Neuromodulation and Pain, Shiraz University of Medical Sciences, Shiraz, Iran*
[2]*Trauma Research Center, Shiraz University of Medical Sciences, Shiraz, Iran*
[3]*Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran*

***Corresponding author:** Maryam Dehghankhalili*
Address: SRC office, 3rd floor, Student Club, Neshat Avenue, P.O. Box: 71345-1978, Shiraz, Iran. **Tel/Fax:** +98-71-32122970; **Cellphone:** +98-917-3683607; **email:** dehghankhaliliam@gmail.com

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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

Iranian Journal of NEUROSURGERY

Risk Factors of Neural Tube Defects in a Sample of Iranian Population from Southern Iran; A Hospital-Based Investigation

Mohammad Sadegh Masoudi [1], Negin Hadi [2], Fariborz Ghaffarpasand [3*], Mohammadreza Askarpour [2], Faeze Ershadi [4], Tayebeh Sadeghpour [5]

[1] Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
[2] Department of Community Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
[3] Neuromodulation and Pain Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[4] Student Research Committee – Department of Community Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
[5] Department of Pediatric Neurosurgery, Namazi Hospital, Shiraz, Iran

* Corresponding Author Address: Research Center for Neuromodulation and Pain, Zand Avenue, Shiraz, Iran. PO Box: 71455-166. Tel/Fax: +98-71-36254206. Cellphone: +98-917-3095214. Email: fariborz.ghaffarpasand@gmail.com

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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 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 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 finding in examination, and clinical finding 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; OR95% CI=1.82) and before pregnancy (p=0.002; OR95% CI= 2.36). The prevalence of neural tube defects was significantly higher in patients who lived in hot climates (p=0.001).

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

Keywords: Neural Tube Defect; Risk Factors; Folic Acid; Geographic Distribution

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Highlights

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

Plain Language Summary

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 are still scarce. In the current study, we included a total number of 100 newborns with NTDs and 200 healthy newborns. The baseline characteristics including the maternal variables (age, weight, height, previous pregnancy and gravid, gestational age), newborn information (birth weight, clinical diagnosis, clinical findings in examination, and clinical findings in radiologic test) and medical history of the perinatal period were recorded and compared between the two study groups. We found that NTDs were associated with lower folic acid intake during pregnancy and before pregnancy. The prevalence of neural tube defects was significantly higher in patients who lived in hot climates. We concluded that taking adequate folic acid supplement before and during pregnancy can reduce the risk of NTDs in Iranian population. Hot climate zones were associated with increased risk of NTDs in Iran.

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

Fariborz Ghaffarpasand[1*], Mousa Taghipour[2]

1. Neuromodulation and Pain Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
2. Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran

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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-

* Corresponding Author:
Fariborz Ghaffarpasand, MD.
Address: Neuromodulation and Pain Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Tel: +98 (917) 3095214
E-mail: fariborz.ghaffarpasand@gmail.com

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

Majid Reza FARROKHI[1], Mohammad Hossein KARIMI[2], Fariborz GHAFFARPASAND[3], Masih SHERAFATIAN[4]

[1]Shiraz University of Medical Sciences, School of Medicine, Shiraz Neuroscience Research Center, Department of Neurosurgery, Shiraz, Iran
[2]Shiraz University of Medical Sciences, Shiraz Transplant Research Center, Shiraz, Iran
[3]Shiraz University of Medical Sciences, Research Center for Neuromodulation and Pain, Shiraz, Iran
[4]Tarbiat Modares University, Faculty of Biological Sciences, Department of Molecular Genetics, Tehran, Iran

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.

Corresponding author: Fariborz GHAFFARPASAND ✉ fariborz.ghaffarpasand@gmail.com

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 0.880 (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

Majid Reza FARROKHI : 0000-0002-4949-7623
Mohammad Hossein KARIMI : 0000-0002-2435-6277
Fariborz GHAFFARPASAND : 0000-0002-1721-9987
Masih SHERAFATIAN : 0000-0002-1101-1966

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Original Investigation

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

Majid Reza FARROKHI[1], Mohammad Hossein KARIMI[2], Fariborz GHAFFARPASAND[3], Masih SHERAFATIAN[4]

[1]Shiraz University of Medical Sciences, School of Medicine, Shiraz Neuroscience Research Center, Department of Neurosurgery, Shiraz, Iran
[2]Shiraz University of Medical Sciences, Shiraz Transplant Research Center, Shiraz, Iran
[3]Research Center for Neuromodulation and Pain, Shiraz, Iran
[4]Tarbiat Modares University, Faculty of Biological Sciences, Department of Molecular Genetics, Tehran, Iran

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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

Majid Reza FARROKHI : 0000-0002-4949-7623
Mohammad Hossein KARIMI : 0000-0002-2435-6277
Fariborz GHAFFARPASAND : 0000-0002-1721-9987
Masih SHERAFATIAN : 0000-0002-1101-1966

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

Mohammad Sadegh Masoudi, MD,[1] Mohammad Ali Hoghoughi, MD,[2] Fariborz Ghaffarpasand, MD,[3] Shekoofeh Yaghmaei, MD,[1] Maryam Azadegan, MD,[1] and Ghazal Ilami, MD[1]

[1]Department of Neurosurgery, [2]Department of Plastic and Reconstructive Surgery, and [3]Research Center for Neuromodulation and Pain, Shiraz University of Medical Sciences, Shiraz, Iran

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.[2,19] 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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In Reply to "Noncoding Ribonucleic Acid Studies of Lumbar Disk Disease: Decade Retrospect"

We have read with interest the letter to the editor by Wang[1] regarding our recently published article in WORLD NEUROSURGERY entitled "MicroRNA Expression Profiles, Target Genes and Pathways in Intervertebral Disk Degeneration; A Meta-Analysis of 3 Microarray Studies."[2] In this meta-analysis we have included 3 microarray studies, which included nucleus pulposus (NP) cells of normal and degenerated intervertebral disks.[3-5] Zhao et al[3] included 20 patients with herniated lumbar disks as the case group and 20 patients with traumatic injuries of the lumbar spine as the control group. In the study by Wang et al,[4] 6 patients with intervertebral disk degeneration (IDD) were included as cases and 6 patients with idiopathic scoliosis undergoing anterior release as controls. Lan et al[5] and Liu et al[6] included 5 patients with IDD and 5 cadaveric donors with normal disks as the control group. Wang[1] raised some concerns regarding the heterogeneity of the data used in our meta-analysis. He believes that there are 3 separate types of heterogeneity in the current study: 1) microarray control samples derived from different scenarios including scoliosis, trauma, and cadaveric disks; 2) total ribonucleic acids (RNAs) were extracted from tissues or isolated cells; and 3) microarray studies were performed with different micro RNA (miRNA) versions. These existing differences may result in risks of bias for result interpretation. He also recommended performing heterogeneity testing to decrease bias in the results.

Studies in a systematic review are inevitably different. Heterogeneity in a systematic review can be defined as any kind of variability among collected studies. Variability in the participants, the study design, or the outcomes cause clinical, methodologic, and statistical heterogeneity, respectively.[7,8] In this article we discuss the heterogeneity in our meta-analysis of IDD.[2] We address 2 main types of heterogeneity in our meta-analysis of microarray studies in IDD: clinical and statistical heterogeneity.[8] The NP cells used in these microarray studies were derived from different scenarios including the scoliosis, trauma, and cadaveric disks. Although these might have different natures, they are all considered normal NP cells. The normality of the disk tissue and NP cells is defined according to the standard radiologic criteria, which is Pfirrmann grading. The Pfirrmann classification was used to classify the grade of degeneration in all the included studies. Grades 3 and 4 of Pfirrmann classification were considered as disk degeneration while grades 1 and 2 were considered as the healthy disks.[9] Thus there have been inclusion criteria regarding the type and extent of the degeneration in included disks. In other words, although the nature of the included samples is different, they share similar radiologic characteristics and grades of degenerations. This explains the clinical heterogeneity of the meta-analysis.

For evaluating the statistical consistency of our meta-analysis results, we calculated the heterogeneity for all 5 differentially expressed miRNAs found in this study and visualized the forest plot for 2 of these miRNAs: 1 upregulated (Figure 1) and 1 downregulated miRNA (Figure 2). As commonly practiced,[10,11] we assessed the statistical heterogeneity in our study by measuring I^2-statistic and drawing forest plots. I^2 was calculated for all miRNAs, which were previously identified as differentially expressed in the results of our meta-analysis. These miRNAs were miR-199a-5p, miR-574-3p, miR-552a, miR-640, and miR-483-5p. All of the calculated I^2 values corresponded to low heterogeneity, and none of the P values were significant ($I^2 < 0.05$). Therefore we deduced that the statistical heterogeneity in our study was nonsignificant. With the help of the meta package[12] in R environment (The R Foundation for Statistical Computing, http://www.r-project.org/foundation), detailed forest plots of miR-552a and miR-483-5p were depicted in Figures 1 and 2, respectively.

Overall, interest in the pathogenesis of IDD is increasing every day and this leads to our increased knowledge of the disease pathogenesis. By elucidating the miRNA mechanisms of the IDD, we can probably establish appropriate treatment and preventive strategies for IDD. Thus, meta-analysis of microarray studies in this field could help determine a significant cause of degeneration in intervertebral disks and guide further research based on their results. The heterogeneity in the current study was not significant and thus the results could be interpreted. However, the clinical and statistical heterogeneity should always be kept in mind when performing such meta-analysis.

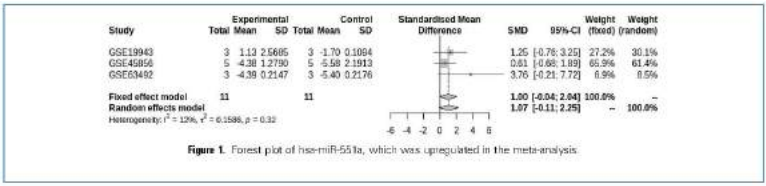

Figure 1. Forest plot of hsa-miR-552a, which was upregulated in the meta-analysis.

LITERATURE REVIEW

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

Masih Sherafatian[1], Hamid Reza Abdollahpour[2], Fariborz Ghaffarpasand[3], Shekoofeh Yaghmaei[4], Maryam Azadegan[4], Mojdeh Heidari[5]

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

From the [1]Department of Molecular Genetics, Faculty of Biological Sciences, Tarbiat Modares University, Tehran; [2]Department of Orthopedics, [3]Research Center for Neuromodulation and Pain, and [4]Students Research Committee, Shiraz University of Medical Sciences, Shiraz; and [5]Department of Biology, Faculty of Science, Razi University, Kermanshah, Iran

To whom correspondence should be addressed: Fariborz Ghaffarpasand, M.D.
E-mail: fariborz.ghaffarpasand@gmail.com; ghafari@sums.ac.ir

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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-551a, 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.[1-3] At any given moment, an estimated 12% of the global population suffers from LBP. The prevalence of LBP reaches 38% annually,[4] and lifetime prevalence has been reported to be as high as 80%.[5] 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.[6] The relationship of LBP to intervertebral disk degeneration (IDD) remains poorly understood.[7,8] Symptomatic disk degeneration is frequently accompanied by aberrant neurovascular ingrowth within the nucleus pulposus (NP) and annulus fibrosis (AF).[9] A regional immune response is elicited by structural changes such as annular tears.[10] The resulting formation of vascularized granulation tissue evokes release of cytokines, including interleukin-6 and interleukin-8 and prostaglandin E_2.[11] These inflammatory mediators are proposed to sensitize local nociceptors, thereby lowering pain thresholds.[12,13] 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.[7]

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.[14,15] 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

TRANSPLANTATION

Review of Renal Biopsies, A Single Center Experience

Maryam Pakfetrat,[1] Leila Malekmakan,[2] Simin Torabinezhad,[3] Omid Yousefi,[4] Dariush Naddaffard[2]

[1]Department of Internal Medicine, Shiraz Nephro-Urology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[2]Shiraz-Nephro-Urology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[3]Department of Pathology, Shiraz Nephro-Urology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[4]Center for Neuromodulation and Pain, Shiraz University of Medical Sciences, Shiraz, Iran

Keywords. kidney diseases, lupus nephritis, membranous glomerulonephritis, primary glomerulonephritis, secondary glomerulonephritis

Special Report

No large study has been conducted on biopsy-proven nephropathies. Our aim was to report clinical and pathological pattern of kidney disease diagnosed by kidney biopsy in our center.
This is a retrospective study on kidney biopsy during 7 years; we analyzed the results of kidney biopsies and their clinical data. Data were analyzed by SPSS 18.0 and a $P < .05$ was considered.
In 1355 kidney biopsies (55.7% women, age = 33.2 ± 16.4), primary glomerulonephritis (GN) was the main feature (57.1%). The most common presentation was asymptomatic urine abnormality (32.3%). Lupus nephritis (24.5%), membranous GN (17.0%), and focal segmental glomerulosclerosis (13.9%) were the most frequent diagnosis.
This study highlights the histopathological patterns of kidney disease in southern Iran. lupus nephritis, membranous GN, and focal segmental glomerulosclerosis are currently the three major diseases. These results have an important role in organizing renal health plans as an initial phase in our population.

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INTRODUCTION

Clinical and pathologic data about kidney disease provides important information.[1-5] Some studies of renal diseases in Western countries are existing from kidney biopsy registries.[6] Several kidney biopsy registries in some countries are available, showing comparable trends in incidence and prevalence of kidney diseases.[7-8] In contrast, few reports provide detailed data for kidney diseases in the Middle East.[6] The essential of kidney disease studies is felt in other regions due to kidney diseases differences in various regions that may arise from the diversity in prevalence of infectious diseases, social/economic status in indication for biopsy, environmental exposure, and socio-economic status.[1-6,9]

In previous papers, we have described a high frequency of chronic kidney disease and dialysis population in our center among different age groups.[10-12] There is a lack of systematic data of renal disease from our country over a long period of time that indicated the needs and usefulness of these studies in this regard.

The aim of this study was to describe the clinical and histopathological patterns of kidney disease diagnosed by kidney biopsy during a period of 7 years in Fars province, Sothern Iran.

MATERIALS AND METHODS

General Data

This is a retrospective study that was performed on renal diseases in native kidneys diagnosed by a biopsy since January of 2011 to December of 2017, from the center of nearly 5 million people, from Fars province, Sothern Iran, by the same pathologist, including the available clinical, laboratorial and histological parameters. A total of 1355 renal biopsies were performed.

Histopathological Data

Biopsies were evaluated by light microscopy and/or electron microscopy (EM). All biopsy

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

Hosseinali Khalili[a], Fariborz Ghaffarpasand[b,*], Amin Niakan[a], Nasim Golestani[c], Iman Ahrari[d], Hamid Reza Abbasi[c], Ali Rasti[c]

[a] Trauma Research Center, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
[b] Research Center for Neuromodulation and Pain, Shiraz University of Medical Sciences, Zand Avenue, Shiraz, Iran
[c] Trauma Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[d] Student Research Committee, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
[e] Poostchi Ophthalmology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

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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 INR 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 evacuatable 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

* Corresponding author at: Research Center for Neuromodulation and Pain, Zand Avenue, PO Box: 71455-166, Shiraz, Iran.
E-mail addresses: khalilih16@gmail.com (H. Khalili), ghafarf@sums.ac.ir (F. Ghaffarpasand), aniakan@sums.ac.ir (A. Niakan), nasim.499@yahoo.com (N. Golestani), imanahrari@gmail.com (I. Ahrari), abbasimezy@yahoo.com (H.R. Abbasi), rastialirasti@gmail.com (A. Rasti).

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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[3] · 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

✉ Alireza Mehdizadeh
mehdizade@sums.ac.ir

✉ Razzagh Abedi-Firouzjah
razzaghabedi@gmail.com

Extended author information available on the last page of the article

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

Hamid Reza Boveiri [a,*], Raouf Khayami [a], Reza Javidan [a], Alireza Mehdizadeh [b]

[a] Department of Computer Engineering and IT, Shiraz University of Technology, Shiraz, Iran
[b] Research Center for Neuromodulation and Pain, Shiraz University of Medical Sciences, Shiraz, Iran

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Stacked auto-encoders (SAEs)

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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* Corresponding author.
E-mail address: hr.boveiri@sutech.ac.ir (H.R. Boveiri).

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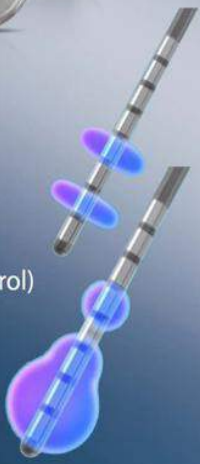

MICC Technology (Multiple Indipendent Current Control)

Directional System

8 Contact Leads

Zero Voltage Technology

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