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DIFFERENTIATED OPERATIONAL TACTICS IN THE TREATMENT OF DESTRUCTIVE PATHOLOGICAL HIP DISLOCATION AFTER HEMATOGENOUS OSTEOMYELITIS

Abstract. The differentiated operational tactics depending on the severity of destruction of the proximal femur and acetabulum is substantiated. The result of the operation was better in children who open reposition of dislocation was complemented by the plastic acetabulum. Reconstructive –restorative operations in most patients provide stability of the hip joint and thus improve the gait and statics of the patient, reduce pelvic distortion and eliminate the symptom of Trendelenburg.

Keywords: osteomyelitis, hip joint, pathological dislocation, osteomyelitis, hip, septic arthritis, treatment.

Introduction

The consequences of osteomyelitis are characterized by extensive scarring of the skin, subcutaneous fat, muscles, impaired blood supply to the affected segment and destructive changes in bone tissue over a significant length. Acute hematogenous osteomyelitis is 6–12.2% of purulent diseases and in 79.1–88.7% of cases affects the long tubular bones [5]. The most common in patients with this pathology is the proximal femoral metaepiphysis. In this case, the course of the disease in 35–56% of children is complicated by pathological dislocation of the hip. According to A. A. Akhunzyanova with co-authors (2006); M. A. Norbekova with co-authors (2006), from 75% to 100% of children with hematogenous osteomyelitis enter the hospital in late terms, which contributes to the development of orthopedic com-

plications that develop in 22–71.2% of children and in 16.2–53.7% of patients lead to early disability [2; 6; 7]. Despite the development of various surgical interventions, the results remain disappointing. Treatment of patients with pathological dislocation of the hip and is currently a difficult and not fully resolved task for orthopedists. It is generally recognized that surgery is the only radical way to treat children with this pathology. It should provide stability of a hip joint for the purpose of improvement of statics and gait of the patient, whenever possible to restore anatomical relations, to reduce shortening of a limb and to keep sufficient mobility. In the surgical treatment of pathological hip dislocation, the primary task is to restore the supporting function of the limb with the preservation of mobility in the joint, followed by the solution of problems to eliminate secondary

deformities and equalize the length of the lower limbs [1; 8; 9].

All methods of operations used in the treatment of pathological hip dislocations can be grouped as follows:

- the use of preserved anatomical formations – reduction in the acetabulum of the residual epiphyseal stump, or a large trochanter of the femur;
- restoration of the femoral neck;
- complete restoration of the epiphysis with bone auto or homotransplant;
- allo- and metal plastics.

Despite the wide variety of treatments, the prognosis for pathological hip dislocation in most cases remains unfavorable. This is evidenced by a large number of residual deformities and discongruence of the femoral head and acetabulum, joint instability leading to the development of shortening and coxarthrosis [3; 4; 5].

Purpose of the study: this work is devoted to the analysis of outcomes of surgical treatment of children with pathological hip dislocation.

Materials and methods of research. The work is based on the results of observation and treatment of 174 patients with pathological hip dislocation treated in the Department of hip pathology of the Republican Center of pediatric orthopedics of the Ministry of Health of Uzbekistan from 2010 to 2018 yy. Among these patients were 81 boys and 57 girls aged from 3 to 14 years. Clinical, x-ray and magnetic resonance imaging studies were applied in the work.

The optimal age for operative treatment of pathological dislocation of the hip, according to our data, is 4–5 years of age of the child, since by this time most patients end the process of ossification of the structures of the hip joint, when secondary deformities have not yet formed and the regeneration processes are well expressed. Planning of operation in patients was based on the assessment of violations of anatomical relations in the hip joint, its function, violations of spatial orientation of the bones forming the joint, as well as violations of the size, shape and

integrity of the bones and was carried out taking into account the selected symptomocomplexes and age of the patient. It should ensure the stability of the hip joint in order to improve the statics and gait of the patient, restore the anatomical relationship in the joint, reduce the shortening of the limb and maintain sufficient mobility. Contraindications to operation treatment: the danger of latent infection in patients who had infectious coxitis 1.5–2 years ago and do not have repeated manifestations of the inflammatory process.

Pathological dislocations of the hip are divided by us into distension ones, i.e. without destruction of the articular surfaces and destructive ones – with destruction of the head, neck of the femur sometimes of the acetabulum. When planning the operation, the nature of the deformation of the proximal end of the femur and the state of the articular cavity and Ilium, which allows forming the necessary size of the cavity, were taken into account. All surgical interventions were accompanied by a revision of the hip joint. The choice of the method of operation depended on the patient's age, the extent of the destruction of the head, the neck of the hip of the acetabulum, the degree of hip displacement. In case of destructive hip dislocation, differentiated operational tactics were used depending on the severity of destruction of the proximal femur and acetabulum. We carried out the following complex reconstructive operations:

- open reposition of the stump of the head or neck of the femur with the intertrochanteric – detorsion, shortening, varus osteotomy in 64 children;
- open reposition of the stump of the head or neck of the femur with the intertrochanteric – detorsion, shortening, varus osteotomy with the plastic acetabulum by Pemberton, Lance, rotational pelvic osteotomy by Salter in 34 children;
- open reposition of the head and neck stump with elongation of the last one and transposition of the hypertrophied big trochanter with the gluteal musculature in the caudal direction with fixing using screw and additionally catgut seams in 29 children.

The purpose of such operations is to create stability in the hip joint, eliminate the vicious position of the limb and the most severe of the symptoms of dislocation – a symptom of Trendelenburg, to reduce the shortening of the limb and, if possible, increase the volume of movements in the joint.

Results and discussion. The results of treatment were evaluated in accordance with the achievement of anatomical and functional results. The result of the operations was better in 34 children, to whom the open reposition of dislocation was supplemented by the acetabulum roof plastic. Operations of open reposition of the head and stump of the femoral neck were reduced to the opening of the hip joint, revision of the proximal end of the femur and the cavity and the mandatory excision of scar tissue. After the joint was mediated, the movement of the iliac bone fragments, the preserved part of the neck and femoral head were submerged under the newly formed roof of the acetabulum. With the growth of children, gradually increased lateralization of the femur, this contributed to the restoration of the function of the middle and small gluteal muscles. It was achieved movement in the joint within the normal range 80° , abduction remained significantly limited, however, adduction contractures is not marked by us in the long term. In this group of patients, a good result in the long term was achieved in 14 children, satisfactory – in 19. Only in one case after open hip reposition there was suppuration of the post-operative wound, which did not affect the outcome of treatment. Thus, the experience of surgical treatment of patients with pathological hip dislocation showed that the most favourable outcomes are achieved with the use of open reposition of the stump of the head

or neck of the femur with the intertrochanteric – detorsion, shortening, varus osteotomy with the plastic acetabulum by Pemberton, Lance, rotational pelvic osteotomy by Salter. The widespread use of these surgical interventions can significantly improve the support and dynamic function of the affected limb.

Summary. After hematogenous osteomyelitis of the proximal end of the femur, destruction of the femoral head and neck is often observed, up to their complete destruction. The optimal age for surgical treatment of pathological hip dislocation, according to our data is 4–5 years of age of the child, because by this time most patients end the process of ossification of the structures of the hip joint, and early surgery often causes severe secondary deformities, up to their complete destruction. Indications for a particular type of intraarticular surgery according to our data, should be strictly individual for each patient, depending on the age of the patient, the type and degree of deformation of the elements of the hip joint and the size of the shortening of the lower limb.

Our observations show that reconstructive and restorative operations in most patients eliminate flexion-adductive and external-rotational contracture, provide stability of the hip joint and thereby improve the gait and statics of the patient, reduce pelvic distortion and eliminate the symptom of Trendelenburg. Surgical treatment of children with destructive pathological dislocations of the hip provides for the first stage of stabilization of the hip joint and the second – the restoration of the length of the lower limb. Restoration of the volume of movements in the hip joint depends on the degree of damage to the head and neck of the femur.

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THE ANALYSIS OF COGNITIVE DISORDERS IN PATIENTS AFTER RECONSTRUCTIVE OPERATIONS IN THE BASIN OF THE INTERNAL CAROTID ARTERIES

Abstract. The results of 20 reconstructive operations on internal carotid arteries in patients with atherosclerotic lesions of carotid arteries were analyzed. The results of the study showed a positive effect of the operation and a significant improvement in brain hemodynamics both on the reconstruction side and on the opposite side. The results of neuropsychological testing clearly demonstrate the improvement of cognitive functions after reconstructive operations in patients with mild and moderate cognitive impairment.

Keywords: moderate cognitive impairment, chronic cerebrovascular accident, reconstructive surgery.

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АНАЛИЗ КОГНИТИВНЫХ НАРУШЕНИЙ У БОЛЬНЫХ ПОСЛЕ РЕКОНСТРУКТИВНЫХ ОПЕРАЦИИ В БАСЕЙНЕ ВНУТРЕННИХ СОННЫХ АРТЕРИЙ

Аннотация. Проведен анализ результатов 20 реконструктивных операций на внутренних сонных артериях у больных с атеросклеротическим поражением сонных артерий. Результаты исследования показали положительный эффект операции и значительное улучшение мозговой гемодинамики как на стороне реконструкции, так и на противоположной стороне. Результаты нейропсихологического тестирования убедительно демонстрируют улучшение состояния когнитивных функций после проведения реконструктивных операций у больных с легкими и умеренными когнитивными нарушениями.

Ключевые слова: умеренные когнитивные нарушения, хроническое нарушение мозгового кровообращения, реконструктивные операции.

Введение

Атеросклеротическое поражение брахиоцефальных артерий является одним из факторов риска развития как острых так и хронических нарушений мозгового кровообращения [1; 2; 3]. Стенозы экстракраниальных отделов брахиоцефальных артерий могут являться маркерами интракраниального атеросклероза, что приводит к нарушению микроциркуляции на уровне мелких сосудов головного мозга и приводит к развитию когнитивных нарушений различной степени выраженности. В связи с этим представляется важным наличие понятия легких и умеренных когнитивных нарушений (УКН) при которых уровень нарушения высших корковых функций не достигает уровня деменции, а характеризуется сохранностью активности в повседневной жизни, при наличии значимого пласта субъективной симптоматики (снижение памяти, внимания, толерантности к психическим нагрузкам) [4]. Вторичная

профилактика их развития хирургическим путем включает два метода: каротидную эндартерэктомию (КЭАЭ) – классическую и эверсионную, и стентирование сонных артерий (ССА) [5; 6; 7]. Однако не всегда ясно в какой степени гемодинамика мозга претерпевает изменения после проведения таких операций и как это отражается на уровне когнитивных нарушений [5].

Материалы и методы

Проведен анализ результатов 20 реконструктивных операций на внутренних сонных артериях у больных с атеросклеротическим поражением сонных артерий. В зависимости от степени стеноза ВСА больные были разделены на 2 группы. К 1 группе были отнесены 9 пациентов со стенозом ВСА от 50% до 70%. Во 2 группе было 11 больных со стенозом ВСА свыше 70%. Состояние когнитивной сферы у всех больных оценивалось до и после хирургического лечения по краткой шкале психического статуса (Mini – Mental State

Examination [MMSE]) с исходным минимумом 26 баллов, тесту рисования часов, батарее тестов на лобную дисфункцию (БТЛД), тесту запоминания десяти слов. В исследование не включали пациентов с выраженными двигательными и когнитивными нарушениями, которые могли затруднить проведение нейропсихологического тестирования. Всем больным была проведена классическая каротидная эндартерэктомия.

Показаниями к реваскуляризации головного мозга в наших условиях являлись: каротидная недостаточность (транзиторные ишемические атаки или нарушение мозгового кровообращения с неврологическим дефицитом) при стенозе сонных артерий более 70% (независимо от морфологической структуры атеросклеротической бляшки); каротидная недостаточность в сочетании с эмбологенной поверхностью атеросклеротических бляшек при стенозе от 50% до 70%; а также при критический стеноз или окклюзии ВСА: наличие протяженной атеросклеротической бляшки ВСА (более 2 см); высокое расположение бифуркации ОСА; поражение ОСА более 2 см проксимальнее бифуркации и необходимость установки временного внутрипросветного шунта после удаления бляшки.

При наложении зажима на общую сонную артерию (ОСА) на стороне КЭАЭ были выявлены три типа снижения скорости кровотока в средне-мозговых артериях (СМА). Первый тип изменений характеризовался незначительным снижением скорости кровотока в СМА (от 0 до 20%), второй тип изменений характеризовался умеренным снижением скорости кровотока в СМА (от 20 до 60%) с медленным незначительным увеличением скорости кровотока в процессе наложения зажима, и третий тип – значительное снижение скорости кровотока в СМА (более 60%). Последняя группа пациентов была оперирована с использованием внутрипросветного временного шунта.

Результаты

Мозговую гемодинамику оценивали до и через 3 недели после хирургического лечения по

данным ТКДГ с определением цереброваскулярной реактивности сосудов головного мозга обоих полушарий. Сравнивали значения линейной скорости кровотока (ЛСК), индекса циркулярного сопротивления (IR) и коэффициента прироста скорости кровотока (КΔV) по СМА на стороне реконструкции и на противоположной стороне. Согласно полученным данным у пациентов после лечения, по данным ТКДГ, наблюдалось достоверное увеличение скорости кровотока по средней мозговой артерии на стороне реконструкции. На противоположной стороне увеличение показателей скорости кровотока по средней мозговой артерии имело менее выраженный характер.

Исследование цереброваскулярной реактивности (ЦВР) с помощью компрессионной пробы показало, что у всех больных после реконструктивных операция на ВСА зарегистрировано существенное ее увеличение, причем по обеим сторонам. У пациентов 1 группы на стороне реконструкции возрастание всех показателей было примерно одинаковым: КΔVs – 10,1%, КΔVd – на 9,9%, КΔVm – 8,9%. На противоположной стороне увеличение вазодилаторного резерва было выражено в меньшей степени и составило 6,2% для КΔVs и КΔVd ($p < 0,05$), а для КΔVm – всего 3,6% ($p > 0,05$). Хотя увеличение ЦВР на стороне реконструкции было более выраженным, но регистрируемые после операции значения КΔVd на этой стороне все же были меньше, чем на противоположной, на 6,2%.

У пациентов 2 группы отмечалось значительное увеличение ЦВР после операций. У них КΔVs, КΔVd и КΔVm на стороне реконструкции увеличился на 11,5%, 27,4% и 18,6% ($p < 0,05$) соответственно, а на противоположной стороне – на 15,3%, 17,9% и 17,1% соответственно. При этом значения КΔVd с обеих сторон достигли величин, равных нормальным. А значения КΔVs и КΔVm оставались несколько ниже нормы.

Сопоставление данных ТКДГ после операции на ВСА в группах показало, что только

у пациентов 1 группы отмечается отчетливое улучшение показателей линейной скорости кровотока. У больных 2 группы значения ЛСК, как IR, после операции не претерпевали существенных изменений, хотя отмечается тенденция к увеличению IR, что может говорить в пользу увеличения внутрисосудистого сопротивления в ветвях СМА. Анализ результатов нейропсихологического исследования в обеих группах до и после лечения выявил улучшение памяти в тесте на запоминание 10 слов на 1,4 балла ($7,1 \pm 1,65$ и $8,5 \pm 1,3$), в тесте рисования часов на 1,2 баллов ($8,5 \pm 1,1$ и $9,7 \pm 0,5$). Улучшение когнитивных функций согласно батарее лобной дисфункции составило 0,8 баллов, по шкале MMSE 2,2 балла.

Выводы. Проведенные исследования показали, что по значениям линейной скорости кровотока и индекса циркулярного сопротивления

судить о гемодинамическом эффекте операции затруднительно. В нашем исследовании положительная динамика ЛСК по СМА на стороне реконструкции прослеживалась только у пациентов 1 группы. В то же время использование компрессионной пробы отчетливо продемонстрировало улучшение мозговой гемодинамики у всех больных и особенно у пациентов, у которых исходная ЦВР была на уровне крайне низких значений. То есть данные ЦВР наглядно показали положительный эффект операции и значительное улучшение мозговой гемодинамики как на стороне реконструкции, так и на противоположной стороне. Результаты нейропсихологического тестирования убедительно демонстрируют улучшение состояния когнитивных функций после проведения реконструктивных операций у больных с легкими и умеренными когнитивными нарушениями.

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THE INNOVATIVE METHOD OF SURGICAL TREATMENT OF ODONTOGENOUS CYSTS IN CHILDREN

Abstract. The article describes the advanced method of surgical treatment of odontogenous cysts of jawbones in children. The main advantages of the proposed method over the traditional technique of surgical intervention are indicated, which allow to accelerate bone regeneration and to prevent a development of unfavorable for child's dental system complications, and thus to increase the effectiveness of treatment of mentioned jaw growths.

Keywords: odontogenous cysts, children, treatment, muco-periosto-bone flap, effectiveness, advantages.

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ИННОВАЦИОННАЯ МЕТОДИКА ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ОДОНТОГЕННЫХ КИСТ У ДЕТЕЙ

Аннотация: В статье описывается одна из усовершенствованных методик хирургического лечения одонтогенных кист челюстных костей у детей. Указываются основные преимущества

предложенного способа перед традиционной техникой оперативного вмешательства, позволяющие ускорить регенерацию костной полости и предупредить развитие неблагоприятных для зубочелюстной системы ребенка осложнений, и, таким образом, повысить эффективность лечения указанных образований челюстей.

Ключевые слова: одонтогенные кисты, дети, лечение, слизисто-надкостнично-костный лоскут, эффективность, преимущества.

Актуальность. Традиционные методики хирургического лечения одонтогенных кист челюстей, предложенные Парчем еще в 1882 году, длительное время применяются в практике хирургической стоматологии. За эти годы отмечены их основные преимущества и недостатки, а также осложнения. К последним относятся: травматичность проведенного вмешательства, длительные сроки регенерации костной ткани в области сформировавшегося дефекта, появление добавочных полостей в полости рта и затруднение в поддержании ее оптимального гигиенического состояния, высокий риск развития воспалительных осложнений и др. Для устранения вышеперечисленных минусов указанных методов был предложен способ хирургического лечения одонтогенных кист у детей с применением слизисто-надкостнично-костного лоскута (СНКЛ).

Материалы и методика. Под нашим наблюдением в городской детской стоматологической поликлинике г. Иркутска находилось 508 детей с одонтогенными кистами челюстей. При этом количество корневых кист составило 168 (32,31% пациентов), а зубосодержащих – 352 (67,69% пациентов), с учетом двусторонней их локализации.

Все пациенты были распределены на две группы в зависимости от метода хирургического лечения кист: в первую группу вошли дети от 6 до 12 лет – 26 человек, у которых использовалась традиционная методика лечения, а во вторую – дети того же возраста – 482 человека, оперировавшиеся по предложенной методике.

Техника её проведения заключается в следующем. Вначале производится удаление причинного зуба под местным обезболиванием. Затем,

несколько отступив от десневого края, под углом 45–60° выполняется основанием обращенный к переходной складке дугообразный или трапециевидный разрез слизистой оболочки и надкостницы таким образом, чтобы края его перекрывали костные границы кистозной полости на 0,5–1,0 см. Это позволяет создать широкую питающую ножку лоскута и оптимальные условия для наложения швов. Далее с помощью желобоватого зонда по линии выполненного разреза рассекается кортикальная пластинка вестибулярной поверхности челюсти с формированием СНКЛ на «питающей ножке». На данном этапе инструмент устанавливается под углом 100–110° и поворачивается на 150–160°. Откидывается СНКЛ. Обнаженная оболочка кисты фиксируется в складку кровоостанавливающим зажимом, а затем осторожно выделяется распатором из костного ложа, в котором локализуется образование, сохраняя зачаток постоянного зуба (ПЗ). Костная рана обрабатывается растворами антисептиков (3% раствор перекиси водорода, 0,05% раствор хлоргексидина биглюконата), после чего СНКЛ укладывается на место узловыми кетгутowymi швами. В лунку удаленного зуба вводится йодоформный тампон. По мере регенерации костной ткани тампон вытесняется из послеоперационной раны.

Результаты исследования. Эффективность оперативного воздействия у пациентов двух групп определялась по отсутствию осложнений, скорости регенерации кости, адекватному формированию и прорезыванию ПЗ. Для этого использовались клинический и рентгенологический контроль итогов оперативного вмешательства,

сроки которого составили от трех недель до трех месяцев наблюдения за больными.

Исследования показали, что у больных первой группы в ранний послеоперационный период наблюдались осложнения в виде отека слизистой оболочки полости рта в области послеоперационной раны (следствие воспаления мягких тканей), расхождение наложенных швов; в поздний период имели место вестибулярное прорезывание ПЗ (38,5% больных), длительность регенерации костной ткани (19,2%), нарушение минерализации твердых тканей ПЗ (5,2%), задержка их прорезывания (3,8%), а также гибель зачатков ПЗ (2,5%). Общее количество пациентов, у которых были выявлены вышеперечисленные осложнения, составило 69,2% от всех прооперированных больных первой группы.

У пациентов второй группы в раннем послеоперационном периоде также были отмечены отек и гиперемия слизистой оболочки полости рта в области оперативного вмешательства, изменения общего состояния ребенка, которые свидетельствуют о нормальном течении послеоперационного периода достаточно инвазивного хирургического вмешательства. Однако в более поздние сроки не было установлено осложнений, описанных у пациентов первой группы. Лишь у 0,78% больных отмечено вестибулярное прорезывание ПЗ и заживление раны вторичным натяжением.

Кроме этого, сроки регенерации костной ткани у пациентов первой группы превышали таковые у пациентов второй группы в 2–3 раза. Костная полость прооперированных традиционным методом через 1,5 месяца после лечения уменьшалась в среднем на 31,1% и сохранялась еще в течение года и дольше, в то время как послеоперационный дефект прооперированных

с применением СНКЛ и вовсе не определялся уже через 1,5 месяца. «Остаточная полость» у пациентов первой группы провоцировала развитие указанных ранее осложнений и, в частности, вестибулярное прорезывание ПЗ, несмотря на правильное положение его зачатка в челюсти. Это дало основание для выявления одного из механизмов аномального прорезывания зуба после операции с применением традиционной методики лечения: зуб продвигается в сторону наименьшего сопротивления, которой является операционный доступ к кисте. Костное окно, закрытое слизисто-надкостничным лоскутом, является «locus minoris resistentiae» для развития репаративных процессов в костной ткани альвеолярного отростка или альвеолярной части челюсти и появления отдаленных осложнений.

Говоря о предложенной методике лечения кист с использованием СНКЛ следует отметить, что ее выполнение благоприятствует репаративным процессам, происходящим в костной ткани. Это, вероятно, обусловлено сохранением костной части вестибулярной стенки челюсти с перистальными сосудами и широкой питающей ножки при формировании СНКЛ, а также быстрым повышением их эластичности, прорастанием новых сосудов, что способствует восстановлению кровообращения в тканях пародонта.

Выводы. Отсутствие ближайших и незначительное количество отдаленных осложнений убедительно свидетельствует, что щадящее оперативное воздействие с сохранением всех элементов альвеолярного отростка или альвеолярной части (слизистой оболочки, надкостницы, кости) позволяют повысить эффективность хирургического лечения одонтогенных кист у детей.

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PSYCHOLOGICAL CORRECTION AS AN INTEGRAL COMPONENT IN THE PROVISION OF PALLIATIVE CARE TO CANCER PATIENTS

Abstract. In the article the necessity of application of psychotherapeutic influence and mental rehabilitation is considered as an integral component in providing palliative care, since the presence of chronic stress objectively worsens the quality of life of patients with advanced stages of the tumor process and additionally burdens the somatic status.

Keywords: psycho-correction, palliative care, oncological patients.

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ПСИХОКОРРЕКЦИЯ – КАК НЕОТЪЕМЛЕМЫЙ КОМПОНЕНТ, ПРИ ОКАЗАНИИ ПАЛЛИАТИВНОЙ ПОМОЩИ ОНКОЛОГИЧЕСКИМ БОЛЬНЫМ

Аннотация. В статье рассмотрена необходимость применения психотерапевтического воздействия и психической реабилитации, как неотъемлемого компонента при оказании паллиативной

помощи, так как наличие хронического стресса объективно ухудшает качество жизни больных с запущенными стадиями опухолевого процесса и дополнительно отягощает соматический статус.

Ключевые слова: психокоррекция, паллиативная помощь, онкологические больные.

Известно, что наряду с клиническими аспектами профилактики, диагностики и лечения онкологических заболеваний, часто наблюдаемое изменение психологического статуса пациентов, которым установлен диагноз злокачественного новообразования, является серьёзной проблемой. Возникает целый ряд негативных эффектов, к которым относятся: суицидальный риск, снижение качества жизни, сокращение сроков выживаемости, неудовлетворительная комплаентность пациентов и увеличение длительности пребывания в онкологическом стационаре [2, с. 688; 3, с. 50]. Наблюдаются негативные изменения в отношениях с родственниками, жизненной активности, трудоспособности далеко не всегда связанные с тяжестью соматического состояния, зачастую обусловленные чисто психологическими причинами [1, с. 67; 4, с. 17; 5, с. 116].

Все это обусловлено тем, что онкологические заболевания у многих больных вызывают психологический хронический стресс, лечение которого должно идти параллельно основной терапии рака, а совместные усилия онколога, психолога и самого пациента станут гарантией успешной социально-психологической и медицинской реабилитации и возвращения больного к активной полноценной жизни в семье [6, с. 98].

Поскольку в Республике Таджикистан паллиативная медицина находится в стадии становления, оценка эффективности различных методов, применяемых для психологической коррекции у больных с распространенными формами злокачественных новообразований, проводится единичными специалистами энтузиастами в этой области медицины и базируется, в основном, на опыте зарубежных коллег.

При неэффективности лекарственного лечения конкретных симптомов следует определиться

с психологическими, психосоциальными и духовными аспектами, возможно, играющими патогенетическую роль. Кроме коррекции так называемых физических причин боли к медицинским методам лечения пациента ближе всего стоят методы психологической терапии, которыми должны владеть и врачи-онкологи в своей обыденной практике, как на этапе установления диагноза, так и на этапах лечения и реабилитации. Целью исследования является определение значения психокоррекции на качество жизни паллиативных больных с онкологическим заболеванием.

Для решения поставленной задачи в исследование были включены 87 больных с генерализованным опухолевым процессом, которым в период с 2010 по 2015 гг., в городе Душанбе оказывалась мобильная паллиативная помощь. Из 87 пациентов мужчин было 43 (49,4%), женщин – 44 (50,6%). Все больные разделены на 3 группы в соответствии с лечением, предшествующим паллиативной терапии. В *первую группу* включены 29 больных, у которых при первичном обращении была установлена IV стадия опухолевого процесса и получавших изначально симптоматическую паллиативную терапию; *вторая группа* – 33 больных, получивших сначала специальные методы лечения (хирургическое, лучевое или химиотерапевтическое) с паллиативной целью, а затем – продолжение в виде симптоматической паллиативной терапии; *третью группу* составили 25 больных, которые сначала получали радикальное лечение, а затем, ввиду неэффективности проводимой терапии – паллиативное.

Мобильная паллиативная помощь оказывалась специальной бригадой, включающей врача онколога, психолога, патронажную сестру и иногда, реаниматолога. Мероприятия паллиативной помощи включали в себя медикаментозную коррекцию патологических симптомов онкологической

болезни и психологическую поддержку пациента и его родственников.

Оценка интенсивности патологических симптомов, характерных для неизлечимого злокачественного новообразования, осуществлялась по вербальной шкале Эдмонта, отраженной в специальной анкете-вопроснике, и заполняемой самими пациентами. Иногда, помощь в заполнении анкеты оказывалась со стороны близких родственников больного или врачом.

Результаты и их обсуждение. Всем онкологическим больным, и особенно тем, кто страдает от неизлечимой болезни, требуется эмоциональная и психологическая поддержка. Необходимо вовлекать пациента или, по крайней мере, соз-

давать у него впечатление активного вовлечения в собственное лечение. При рассмотрении этого метода психологической терапии в расчет принимаются психологические и социальные проблемы. В процессе лечебных мероприятий пациентов окружают заботой, рекомендуют активно участвовать в принятии решений относительно лечебной тактики. Взаимоотношения такого рода необходимы для предупреждения субъективных ощущений страха, тревоги, мнимой заброшенности. С целью определения вариантов нарушений в психосоматическом статусе этой категории больных, нами использована вербальная шкала Эдмонта, основные симптомы которой отражены в (таблица 1).

Таблица 1. – Система оценки симптомов по Эдмонтону

Отсутствие боли	0	1	2	3	4	5	6	7	8	9	10	Максимальная боль
Отсутствие усталости	0	1	2	3	4	5	6	7	8	9	10	Максимальная усталость
Отсутствие сонливости	0	1	2	3	4	5	6	7	8	9	10	Максимальная сонливость
Отсутствие тошноты	0	1	2	3	4	5	6	7	8	9	10	Максимальная тошнота
Отличный аппетит	0	1	2	3	4	5	6	7	8	9	10	Полное отсутствие аппетита
Отсутствие одышки	0	1	2	3	4	5	6	7	8	9	10	Максимальная одышка
Отсутствие депрессии	0	1	2	3	4	5	6	7	8	9	10	Максимальная депрессия
Отсутствие тревоги	0	1	2	3	4	5	6	7	8	9	10	Максимальная тревога
Отличное самочувствие	0	1	2	3	4	5	6	7	8	9	10	Максимально плохое самочувствие
Отсутствие запора	0	1	2	3	4	5	6	7	8	9	10	Максимальный запор
Отсутствие кровотечения	0	1	2	3	4	5	6	7	8	9	10	Максимальное кровотечение
Другая проблема	0	1	2	3	4	5	6	7	8	9	10	Максимальное значение

Пожалуйста, обведите номер, который наилучшим образом описывает состояние пациента в НАСТОЯЩИЙ МОМЕНТ

Опрос показал, что у практически 85% больных, основными проявлениями психогенной реакции были – страх, депрессия и тревога, причем нередко уровень их зашкаливал за 8–9 баллов. В то время как, интенсивность физических страданий, характеризуемая в других графах (боль, тошнота, плохое самочувствие, кровотечение), была несколько ниже – в пределах 5–6 баллов и дополнительно оказывало негативное влияние на психику больного. Нами было отмечено, что

у большинства пациентов, по субъективным или объективным причинам полностью или частично лишенных общей психологической поддержки, значительно хуже поддавались медикаментозному контролю патологические проявления запущенной опухоли. И наоборот, при дополнении терапевтических мероприятий методами психологической коррекции, пациенты быстрее справлялись с физическими проявлениями болезни, осложнившими течение прогрессирующего онкологического процесса.

По мере ухудшения самочувствия, появления все более стойких болей, может усугубляться

и депрессивное состояние с постоянной мыслью о неизбежности смерти, с потерей интереса ко всему, что составляло смысл жизни. В период генерализации онкологического процесса и развившегося хронического психологического стресса, чувства пациента резко обостряются, он страдает быстрой сменой настроения, внимательно прислушиваясь к разговору врачей с родственниками, и неадекватно реагирует на любое неосторожно оброненное слово или медицинский термин. Моменты истерического возбуждения сменяются минутами успокоения, и ожидания новых приступов боли.

Принципиально важно на этом этапе использовать весь арсенал медикаментозной терапии, с целью ликвидации, либо минимализации физических последствий запущенной злокачественной опухоли, так как улучшение соматического статуса вселяет больше веры в хороший исход у больного, страдающим раком. Эту веру поддерживает и лечащий психолог, скрывая от пациента истинные причины плохого состояния, настраивая его на хороший лад и проводя беседы с пациентом и его

родственниками о необходимости продолжения начатой терапии.

Успех всей паллиативной терапии зависит от веры больного в излечение и надежды на возможность вернуться к нормальному существованию и, иногда, трудовой деятельности. Задача психолога, состоит в том, чтобы вернуть больному эту надежду и укрепить его веру во все хорошее, а задача онколога и патронажной сестры уменьшить физические страдания пациента, планомерно проводя симптоматическое лечение с применением современных достижений фармакологии.

Вывод. Психострессорные реакции, с преобладанием тревожно-депрессивного состояния значительно ухудшают качество жизни онкологических больных с запущенными стадиями опухолевого процесса, отягощают соматический статус и усиливают физические страдания. Всё это диктует необходимость и целесообразность проведения психотерапевтического воздействия и психической реабилитации, как неотъемлемого компонента при оказании паллиативной помощи.

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Section 2. Biomedical science

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NURSES' KNOWLEDGE ABOUT SUBSTANCE ABUSE AND WITHDRAWAL SYMPTOMS AMONG PATIENTS IN AL-AMAL HOSPITAL-JEDDAH

Abstract

Background: Substance abuse and withdrawal symptoms it is become a major health problem in different countries, affecting all levels of society, with possible irreversible consequences and could affect a person's relationships, educational opportunities, employment status, status in society, and general health and wellness. nurses' knowledge in this area is especially important.

Aim: To assess the level of nurses' knowledge about substance abuse and withdrawal symptoms among patient at al-Amal hospital in Jeddah.

Methods: A quantitative descriptive design was used in current study. A convenience sample of one hundred and forty-eight nurses were voluntary participate in the study.

Setting: the study carried out at Al-Amal hospital- Jeddah.

Tools: A self-structured questionnaire was used for data collection. This questionnaire assessed nurses' knowledge of substance abuse and withdrawal symptoms. Nurses' knowledge was examined by six items forced response agree/disagree and 17 items multiple-choice a graded across three grades of high level of knowledge from 16–23 average level of knowledge from 8–15 and low level of knowledge from 0–7.

Result: the result indicated that nurse's knowledge was an average level (70.47% SD \pm 14.27). In contrast, the education level and departments had a statistically significant different with their knowledge.

Conclusion: The finding of present study showed that the nurses working in Al-Amal hospital held an average level of knowledge about substance abuse and withdrawal symptoms.

Recommendation: results of current knowledge surveys of nurses suggest that need for regular training and in-services education to provide the nurses skill and advanced knowledge to screen

the substance abuse and withdrawal symptoms and applied guideline for nursing management of detoxification and over dose.

Keywords: nurses' knowledge, substance abuse, withdrawal symptoms.

Introduction

The problem of substance abuse in the last decade of the twentieth century was exacerbated not only by economic, social and social complications but also by the high cost of primary prevention and secondary prevention programs and their failure to reduce the risk of addiction through the treatment of addicts [1]. Substance abuse it is become a major health problem in different countries, affecting all levels of society, with possible irreversible consequences. Substance abuse could affect a person's relationships, educational opportunities, employment status, status in society, and general health and wellness [2].

In 2013 was estimated that globally, 246 million people (1 out of 20) aged between 15 years and 64 years used an illicit drug, out of whom about 27 million people are problem drug users [3]. Furthermore, in Saudi Arabia, according to the National Commission for Drug Control, in 2014, there is increasing of substance abuse among Saudis and associated with many medical diseases, psychiatric disorders, and educational, occupational, social and legal consequences. Amphetamine, heroin, alcohol and cannabis were the most commonly abused among Saudi patients and the main risk factors were peer pressure and psychosocial stresses [1] On other hand, Over the past 10 years there is growing in awareness and attention regarding to the drugs abuse to be a parallel with the vision of 2030 in Saudi Arabia [4].

Substance abuse patient will be suffering from physical symptoms it is include withdrawal symptoms, which is caused by the negative response of the body to become without a substance and it's will be depended on the time of use. Withdrawal symptoms defines by the National Institute of Drug Abuse (NIDA) as a probable group of signs and symptoms will be result from the sudden stop of use or decrease

in the steady dosage of a drug. These signs and symptoms of withdrawal symptoms could be varied significantly from one drug to the others [5].

Nurses' knowledge about substance abuse and withdrawal symptoms can play a major role in the misdiagnosis patients with substance abuse problems [6]. Lack of nurses' knowledge about substance abuse and withdrawal symptoms is one of the barriers occur to nurses screening for patients with substance abuse problems, it can cause poor screening, misdiagnosis and low intervention [7]. On other hand, insufficient educational content regarding substance abuse in essential nursing curricula, and a considerable shortage of professional education, continuing education, and training can cause inadequate nursing care for patient with substance abuse issues [8].

Methods:

A quantitative and descriptive research design has been adopted as a research design for this study. The study was conducted at Al-Amal hospital affiliated to Ministry of Health (MOH) in Jeddah city. a convenience of sampling method used to select the sample of 217 nurses whose give the direct patients care in Al-amal hospital. Tool of data collection was translated into Arabic language and a total of five expertise in nursing field reviewed the study tools. the internal consistency using Cronbach's alpha coefficients. Reliability of this study was 0.72 a pilot study was conducted on 10% of the study participants out of calculated sample size of 217 nurses. The pilot study conducted among 20 nurses from selected area according to the inclusion criteria after obtaining permission. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 22. Descriptive measurement. The data was collected by head nurses and only the researcher had access to data throughout the study. The research tool that used to collect data for the present study was a self-

administered. The structured questionnaire divided to two parts: Part I: Includes 11 items divided to two Sections: Section a: Socio – demographic details of the participants 6 items such as (Sex, Age, Nationality, Marital status, Educational level, Department). Section b: clinical experiences such as (Professional experience in al-Amal hospital, Professional experience in general hospital) and 7 Motivational statements to work with substance abuse patients. Part II: Includes 23 items divided to two Sections: Section a: 6 items forced response agree/disagree based on the work of **Happell et al.** [9] to assess the facts about drugs and alcohol use. Items number 2, 5 consider correct answer of respond by disagree. Section b: 17 items multiple-choice 7 items (5, 6, 7, 8, 9, 10, 11) based on the work of Happell et al. (8) and 10 items (1, 2, 3, 4, 12, 13, 14, 15, 16, 17) developed by the National Council Licensing Examination (NCLEX) to assess the Nurses' knowledge about substance abuse and withdrawal symptoms. Coding system for Nurses' knowledge about substance abuse and withdrawal symptoms.: True answer = 1, False answer = zero.

Finally, the total scores of correct answers were 23 and all items was computed and classified in as follows: high level of knowledge from 16–23 average level of knowledge from 8–15 and low level of knowledge from 0–7.

Two major principles were upheld to ensure the ethical validity of the study: Firstly, authorization of

the Ethics Review Committee of ethical committee in Faculty of nursing, King Abdul-Aziz University and committee in ministry of health (MOH) and al- Amal hospital was obtained. Secondly, informed consent of all participants in the study above was secured. All participants were assured of the confidentiality of data collected.

Result:

The total sample size for the study was 149 nurses. A large proportion of study participants age was between 31–40 years accounted for 63.1% and lowest was 51 years and more accounted for 4.7%. It is noteworthy that most of participants were primarily male and were married (79.9% & 80.5% respectively). As regarded the nationality 85% of participants were Saudi only 14.1% were non-Saudi. Regarding educational level sixty-three present of study sample has diploma degree while 34.2% achieved bachelor's degree in nursing and only 2.0% were master degree. Out of 149 nurses who participated. The highest participated (18.8%) from female ward and the lowest (5.4%) from ward M. In addition, thirty percent of study participate had more than two years' experience in general hospital and 26.2% had 6–9 years only 8.1% had more than 14 years of experience. About one third (32.9%) of participant had 6–9 years of experience in Al-Amal hospital and lowest percentage of the (6.7%) had more than 14 years as (Table 1).

Table 1. – Distribution of study participants according to their Socio-Demographic characteristics (n=149)

Socio-Demographic characteristics	study participant(n = 149)	
	Frequency No.	Percent (%)
<i>1</i>	<i>2</i>	<i>3</i>
Gender		
Male	119	79.9%
Female	30	20.1%
Age		
less than 30 years	43	28.9%
31–40 years	94	63.1%
41-50 years	5	3.4%

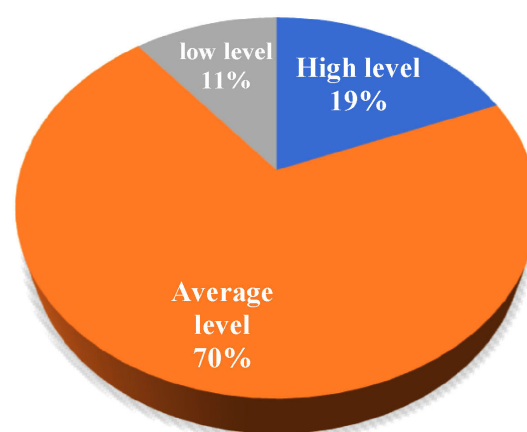
1	2	3
51 years and more	7	4.7%
Marital Status		
Single	28	18.8%
Married	120	80.5%
Divorced	1	7%
Nationality		
Saudi	128	85.9%
Non-Saudi	21	14.1%
Education		
Master degree	3	2.0%
BNS degree	51	34.2%
Diploma degree	95	63.8%
Department		
Male Ward A (detoxification security unit)	27	18.1%
Male Ward B (detoxification unit)	27	18.1%
Male Ward C, D (behaviors modification unit)	25	16.8%
Male Ward M (post-discharge continuous care unit)	3	5.4%
Male ER	19	12.8%
Male OPD	6	4.0%
Adolescent ward	9	6.0%
Female ward	28	18.8%

Most of the participants (75.5%) were attend training education or courses related to drug abuse & withdrawal symptoms. while thirty-eight reported that not attend the training related to drug abuse & withdrawal symptoms.

Regarding to the nurses' level of knowledge, the highest number of participants had an Average level of the Knowledge 105 participants. 28 of participants had a High level of the Knowledge. Only 16 had a Low level of the Knowledge. In addition, Overall Nurses' knowledge and total mean scores were $14.27 \text{ SD} \pm 3.11$ as (Figure 1).

The analysis of variance one-way ANOVA was used to identify the statistically significant between Nurses' knowledge about substance abuse and withdrawal symptoms and their Socio-demographic characteristics.

levels of the Nurses' knowledge



■ High level ■ Average level ■ low level

Figure 1. levels of nurses' knowledge about substance abuse and withdrawal symptoms

The finding shows that nurses less than 30 years of old had the highest mean scores of $13.35SD \pm 2.64$ and the nurses from 51 years and more had the lowest mean score. In addition, female participants had a mean score of $13.43 SD \pm 2.62$ higher than male participates. Regarding marital status, single nurses had the highest mean of $13.11 SD \pm 4.99$. Also, nurses with BNS degree mean scores was the highest with mean of $13.48 SD \pm 3.62$ and lowest score was belonged to nurse with Master's degree. Moreover, nurse who working in Male ER had a highest mean score of $15.95 SD \pm 6.23$ and lowest mean score from Male

Ward M (post-discharge continuous care unit). In addition, nurses with clinical experience in general hospital more than 2 years had the highest mean scores of $13.87 SD \pm 4.08$ and who had Professional experience in al-Amal hospital from 2–5 years. However, test revealed that there was no significant different between Nurses' knowledge about substance abuse and withdrawal symptoms and gender, age, marital status, Nationality and Professional experience in general hospital or AL-Amal Hospital. In contrast, the education level and departments had a significant different with their knowledge ($p < 0.05$) as (Table 2) indicated.

Table 2. – The relationship between Nurses' knowledge about substance abuse and withdrawal symptoms and their Socio-demographic characteristics (N = 149)

Socio-demographic characteristics	Participants' knowledge about substance abuse and withdrawal symptoms	Test of significant (Sig.)	
		T-value	p-value
	Mean \pm SD		
Gender			
Male	12.72 SD \pm 3.85	-1.199	0.235
Female	13.43SD \pm 2.62		
Age			
less than 30 years	13.35SD \pm 2.64	0.951	0.418
31–40 years	12.66 SD \pm 3.98		
41–50 years	12.80 SD \pm 4.87		
51 years and more	11.00 SD \pm 2.83		
Marital Status			
Single	13.11 SD \pm 4.99	0.656	0.521
Married	12.75 SD \pm 3.26		
Divorced	9.00 SD \pm 0.01		
Nationality			
Saudi	12.62 SD \pm 3.77	-1.509	0.134
Non-Saudi	13.95 SD \pm 2.84		
Education			
Master's degree	8.00 \pm 3.46	2.957	0.058*
BNS degree	13.48 \pm 3.62		
Diploma degree	12.56 \pm 3.57		

* relation is significant at the 0.05 level

Discussion:

The result shows that nurses from different wards participated in the current study to answering the questionnaire to assess the level of nurse's knowledge about substance abuse and withdrawal symptoms. The

number of male participants were much higher than female participants. A possible explanation for this result might be the high ratio of male nurses comparing to female nurses. In addition, there are a seven male wards in the Al-Amal hospital and only one female ward and

it is not allowed for female staff to work with male patients regarding to the hospital policy. This result contradicted to many other results [10; 11] and [12], as they found that majority were female.

Likewise, about one third of study sample have clinical experience that ranged from six years to nine years. This result may be the majority of study participants were between 31–40 years of age. Similar result found by [10] and [11].

According to the nationality, the majority were Saudi. This result may due to governmental policy to maintain the patient privacy and confidentiality. In addition, nurses who working with substance abuse patients should have the same language to provide a good communication with patients and for educating them and their families about the risks of substance abuse and their treatment options.

In addition, a diversity of nurses with different background, more than half of the study participant belong to nurses with diploma degree. This result may be explained that nurses feel uncomfortable when working with people who are dependent on drug and held negative views about people who used drugs.

In addition, according to the overview of the implications of bachelor's degree nurse education in Saudi Arabia (SA) done by (Noura A., 2015) [13] reported that "the majority of nursing workforce was diploma holder".

As regards to the clinical experiences to study participants in the management of substance abuse patients in al-Amal hospital-Jeddah. One third of participant had 6–9 years of experience in Al-Amal hospital and more than half of the nurses had received formal training in substance abuse and withdrawal symptoms. This result may be that two third of the participants had a need to attend courses or training education about substance abuse and withdrawal symptoms to enhance their knowledge. This result similar to study finding by (Cameron,2006) and contraindicated with [14] Leonieke C. van Boekel, 2013), [15] (Rosmary, 2008) and [16] (CaraElizabeth, 2011) were find the more than half

of the sample had not received training in drug and alcohol issues.

Nurses knowledge about substance abuse and withdrawal symptoms in current study was examined by multiple-choice and forced response. The results revealed that the level of nurse's knowledge was ranged between a minimum and maximum of correct response of 6–19. The finding of this study shows a high level of knowledge in diagnosis of substance abuse and withdrawal symptoms, management of alcohol use and average level in relation to signs and symptoms of substance abuse and withdrawal symptoms. In addition, the finding show that nurses demonstrate a very low level of knowledge in medication commonly used for patient with heroin and cannabis use symptoms. This result may be due to the participants had experiences in general hospital and Al-Amal hospital more than two years. In addition, the majority had training and motivated to work with substance abuse patients in Al-Amal hospital. The finding of the present study is contrary to the findings conducted by [17] (Maigari, B., 2014) in Nigeria to assess the nurses' knowledge and attitude towards substance abuse patient. They found out that "the total knowledge scores presented that 42.6% had good knowledge, 19.6% of nurses had very good knowledge, while 14.2% had poor knowledge".

The current study found no statically significant different between Nurses' knowledge about substance abuse and withdrawal symptoms and gender, age, marital status, Nationality and Professional experience in general hospital or AL-Amal Hospital. However, a statically significant relation was found between nurses' knowledge and education level and between nurses' knowledge and departments ($p < 0.05$). This finding agrees with [18] (Nedenleri, 2016) were found that all sociodemographic and professional characteristics of emergency nurses have no effect on nurses' perceptions about the substance abuse and withdrawal symptoms.

In current study a statically significant relation was found between nurses' knowledge and education level. Nurses who have a bachelor's degree

show a high level of knowledge with scores mean 13.48 ± 3.62 . baccalaureate nursing programs offer 1 to 5 hours of alcohol and drug abuse content throughout their curriculum. This result was consistent with [11] identified that "participants with some training in alcohol and drug abuse after their nursing education and/or who received some type of preparation for working with these health problems during their nursing education showed higher mean scores on the Knowledge questionnaire" and contradicted with [9] reported that "available knowledge on the fact that nurses' negative beliefs, values, and thoughts do not change even if they come across such patients and probably, they contact with the patients less".

Regarding to the relation between Nurses' knowledge and departments, nurses working in the emergency department show the high mean score. This result may be due to the nurses in emergency room frequently facing the patients with substance abuse issues and withdrawal symptoms and receiving their first intervention in this department.

Conclusion:

The main aim of this study was to assess the nurse's knowledge about substance abuse and withdrawal symptoms. To answer this question, descriptive design was used to assess the level of nurse's knowledge. The finding of present study showed that the nurses working in Al-Amal hospital held an average level of knowledge about substance abuse and withdrawal symptoms and had a significant relation to the education level and departments.

Recommendation:

The finding from current study suggest several actions must be undertaken include the following:

- Hospital administration should give the nurses opportunity to attend conference and

workshop regional or national regarding to substance abuse and withdrawal symptoms to ensure nurses awareness about substance and withdrawal management guideline and policies.

- Periodically assess the nurse's competence regarding substance abuse and withdrawal symptoms and motivate them on professional growth which influence their knowledge.
- Implement the clinical guidelines for withdrawal management and treatment of drug dependence in Al-Amal hospital.
- The result of current study should be share with stake holder at Jeddah to establish educational program for nurse in the area.
- Further investigation is required to examine the effect of education intervention on nurse's knowledge regarding to substance abuse and withdrawal symptoms in addiction setting in Saudi Arabia.
- Another possible area of future study would be to investigate the barrier affecting nurse's knowledge about substance abuse and withdrawal symptoms and identified a problem that rises on the job.
- Future research could further develop education program for nurses to provide Screening Brief Intervention and Referral to Treatment to substance abuse patients.

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EFFECTIVENESS OF AQUEOUS EXTRACT FROM *LEMNA MINOR* FROND AT AUTOIMMUNE THYROIDITIS IN RATS

Abstract. This article presents the study of the effect of aqueous extract from *Lemna minor* frond on functional state of thyroid gland in experimental autoimmune thyroiditis in rats. It founded that the introduction of aqueous extract from *Lemna minor* frond decreases levels of TgAb and increases of T4 level in the blood serum of rats with autoimmune thyroiditis.

Keywords: aqueous extract from *Lemna minor* frond, autoimmune thyroiditis, thyroid hormones, thyroid peroxidase antibodies, thyroglobulin antibodies.

The literature indicates that thyroid disease occupy the last place among all endocrine pathology, and still remains one of the most difficult problems in clinical endocrinology. This confirmed by the ever-increasing incidence and high rates of disability in this pathology that is associated with environmental degradation, inadequate intake of iodine, increase the frequency of autoimmune diseases. Almost every second or third person on Earth has a particular pathology thyroid structure in which autoimmune thyroiditis (AIT) in frequency and social significance takes first place [3; 5; 14].

Pathogenetic mechanisms, reliable and objective diagnostic methods, theoretically substantiated methods of treatment of this disease are not definitively determined. The global trends in the treatment of AIT have traditionally been reduced to substitution therapy by means of various variants of the dosage forms of thyroid hormones. Therefore, the lack of modern therapeutic approaches or alternative traditional therapies in the modern world market of new approaches that would contribute to the normalization of the functional activity of the thyroid gland

causes the relevance of finding new concepts for the comprehensive elimination of AIT [2; 7; 14; 15; 16].

Correction of thyroid dysfunction may be associated with both intake of thyroid hormones and bioactive substances in the blood stream of drugs used for the treatment of metabolic processes [6; 7; 9; 11]. The most promising source of biologically active substances are medicinal plants. The feasibility study in this area of medicinal plants is determined by a wide range of pharmacological actions and the relative safety of long-term use [11; 12; 14].

One of the most promising plants, which contains a set of biologically active substances is *Lemna minor*. As a result of research in phytochemicals *Lemna minor* frond was established presence of iodine and 14 elements (calcium, potassium, silicon, sodium, etc.), and 32 biologically active substances of different chemical groups (phytosterols, saturated hydrocarbons, aldehydes and ketones, fatty acids, etc.) [1]. Also established the presence of amino acids, including aspartic and glutamic acid, arginine, leucine, alanine, valine and lysine [6]. Therefore, the aim of our investigation was to study the effect of

aqueous extract from *Lemna minor* frond (AELMF) on thyroid function in rats with experimental AIT.

Materials and methods of research. The experiments were performed on white nonlinear rats weighing 180–200 g male in compliance with Commission on Bioethics and Pharmacy “General ethical animal experimentation” (Kyiv, 2001), consistent with the provisions of the European Convention “On Protection of Vertebrate Animals used for experimental or other scientific purposes” (Strasbourg, 1986).

Experimental AIT induced in rats by immunization of human thyroid antigen in combination with a complete adjuvant Freud. Introduction AELMF performed intragastric 1 week after the last immunization within 21 days. Upon expiration of the animals taken out of the experiment and measured serum level of thyroid peroxidase antibodies (TPOAb), thyroglobulin antibodies (TgAb), thyroid-stimulating hormone (TSH) and thyroid hormones – thyroxin (T4) and triiodothyronine (T3) by immunoassay analysis using test systems (LLC “Hema”, Russia).

Statistical analysis of the results was performed using standard statistical software package «Statistica 6,0». The experimental data are presented as the mean, its error ($\pm S$). Statistical analysis of the results was performed using nonparametric analogue univariate ANOVA – Kruskal-Wallis criterion and then used the Mann-Whitney criterion. Differences between groups was considered likely adopted at the level of statistical significance of $p < 0.05$ [10; 13].

Results and discussion. Because of the induction of experimental AIT in rats, differences from control animals in the state of the thyroid system were observed, indicating the development of thyroid dysfunctional state in rats, which is a hallmark of AIT.

Induction of AIT practically did not affect the relative mass of thyroid gland (20.50 ± 0.52 mg in intact animals versus 23.60 ± 0.54 mg in the control

group), but in animals there was a decrease in the level of T4 (55.50 ± 1.99 nmol/l in intact animals versus 46.70 ± 1.24 nmol/l in the control group). The level of T3 practically did not change (1.40 ± 0.03 nmol/l versus 1.32 ± 0.04 nmol/l). Regarding the free fraction of T4, its elevation was noted (11.87 ± 0.67 pmol/l versus 13.72 ± 0.50 pmol/l), which may indicate a disturbance in the system of binding of thyroid hormones and transport proteins and diminishing their affinity for globulins and albumins in circulating blood. The content of free fraction T3 also practically did not change.

In determining the level of thyroid antibodies, an increase in blood concentrations of TgAb was observed (35.67 ± 0.90 U/ml versus 92.54 ± 2.02 U/ml), however, the level of TPOAb was reduced (23.49 ± 0.76 U/ml versus 12.04 ± 0.32 U/ml). Such fluctuations in the level of TPOAb in the blood coincide with the current literature data on the significance of this indicator in the development of AIT. Until recently, it was believed that TPOAb are the only antibodies that can fix the complement and cause necrosis of thyroid cells. However, modern studies suggest that complement-mediated cytotoxicity with respect to thyroid cells may have other antibodies.

The use of AELMF in animals with AIT resulted in an increase in the concentration of T4 (54.49 ± 1.25 nmol/l) and TgAb (42.82 ± 2.23 U/ml) to the level of rats in the intact group. In this case, the investigated extract almost did not affect the level of free T4 and TPOAb. They remained at the level of indicators of animals in the control group.

Conclusions. Experimental AIT induced by administration of thyroid antigen human development characterized by the negative effects on functional state of thyroid gland, which manifested in decreasing of T4 level, increasing of free T4 and TgAb in serum. Introduction of AELMF helped to restore the T4 and TgAb levels in serum of rats with AIT.

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Section 3. Preventive medicine

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DEVELOPMENT OF A MODEL TO PREDICT THE RISK FACTORS FOR HEART DISEASE

Abstract

Objective: This study aims to: 1) examine the predictors of heart disease, 2) build a predictive model for heart disease using artificial neural network and compare its performance to logistic regression model.

Methods: A public database was used for this study. This dataset focuses on the prediction of indicators/diagnosis of heart disease. The features cover demographic information, habits, and historic medical records.

All the participants who were eligible were randomly assigned into 2 groups: training sample and testing sample. Two models were built using training sample: artificial neural network and logistic regression. We used these two models to predict the risk of heart disease in the testing sample. Receiver operating characteristic (ROC) were calculated and compared for these two models for their discrimination capability and a curve using predicted probability versus observed probability were plotted to demonstrate the calibration measure for these two models.

Results: About 54.5% (n = 165) of 303 were patients with heart disease; 75% of the 96 female people and 45% of the 207 male people with heart disease. The male is 82.8% (1-0.172) less likely to have heart disease than the female. Patients with chest pain were 136% (2.363-1) more likely to have heart disease than the patients without chest pain. The chance to have a heart disease increased by 2% when the maximum heart rate achieved increased by 1. Patients who had exercise induced angina were 62.5% (1-0.375) less likely to have heart disease. Patients who had ST depression induced by exercise were 41.7% (1-0.583) less likely to have heart disease. The chance to have heart disease decreased by 53.9% when the number of major vessels (0-3) colored by flourosopy increased by 1. Patients without thalassemia were less likely to have heart disease.

According to this neural network, the top 5 most important predictors were number of major vessels (0-3) colored by flourosopy (CA), resting electrocardiographic results (restecg), serum cholesterol in mg/dl (chol), maximum heart rate achieved (thalach), thalassemia.

For training sample, the ROC was 0.94 for the Logistic regression and 0.99 for the artificial neural network. Artificial neural network performed better clearly. However in testing sample,

the ROC was 0.90 for the Logistic regression and 0.85 for the artificial neural network. Artificial neural network had worse performance.

Conclusions: In this study, we identified several important predictors for heart disease e.g., sex, heart rate. This provided important information for providers and patients to provide timely intervention.

Keywords: predictors of heart disease, the risk factors for heart disease, heart disease, predictive model, heart rate.

1. Instruction

Heart disease is the leading cause of death for both men and women. More than half of the deaths due to heart disease in 2015 were in men. About 630,000 Americans die from heart disease each year – that's 1 in every 4 deaths [1]. Coronary heart disease is the most common type of heart disease, killing about 366,000 people in 2015. In the United States, someone has a heart attack every 40 seconds [2]. Each minute, more than one person in the United States dies from a heart disease-related event. Heart disease is the leading cause of death for people of most racial/ethnic groups in the United States, including African Americans, Hispanics, and whites. For Asian Americans or Pacific Islanders and American Indians or Alaska Natives, heart disease is second only to cancer. Heart disease costs the United States about \$200 billion each year. This total includes the cost of health care services, medications, and lost productivity.

High blood pressure, high LDL cholesterol, and smoking are key heart disease risk factors for heart disease. About half of Americans (49%) have at least one of these three risk factors [3].

This study aims to 1) examine the predictors of heart disease 2) build a predictive model for heart disease using artificial neural network and compare its performance to logistic regression model.

2. Data and Methods:

Data:

Data Set Information:

This database contains 76 attributes, but all published experiments refer to using a subset of 14 of them. In particular, the Cleveland database is the only one that has been used by ML researchers to this date.

The “goal” field refers to the presence of heart disease in the patient. It is integer valued from 0 (no presence) to 4. Experiments with the Cleveland database have concentrated on simply attempting to distinguish presence (values 1, 2, 3, 4) from absence (value 0).

Attribute Information:

Only 14 attributes used: 1. #3 (age) 2. #4 (sex) 3. #9 (cp) 4. #10 (trestbps) 5. #12 (chol) 6. #16 (fbs) 7. #19 (restecg) 8. #32 (thalach) 9. #38 (exang) 10. #40 (oldpeak) 11. #41 (slope) 12. #44 (ca) 13. #51 (thal) 14. #58 (num) (the predicted attribute)

The data could be downloaded at: <https://www.kaggle.com/ronitf/heart-disease-uci>

Variables:

Table 1. – Variables used in this study

age	age in years
sex	(1 = male; 0 = female)
cp	chest pain type
trestbps	resting blood pressure (in mm Hg on admission to the hospital)
chol	serum cholesterol in mg/dl
fbs	(fasting blood sugar > 120 mg/dl) (1 = true; 0 = false)
restecg	resting electrocardiographic results
thalach	maximum heart rate achieved
exang	exercise induced angina (1 = yes; 0 = no)
oldpeak	ST depression induced by exercise relative to rest
slope	the slope of the peak exercise ST segment
ca	number of major vessels (0–3) colored by fluoroscopy
thal	3 = normal; 6 = fixed defect; 7 = reversible defect
target	1 or 0

3. Results

About 54.5% (n = 165) of 303 were patients with heart disease; 75% of the 96 female people and 45% of the 207 male people with heart disease.

Basically, a corrgram is a graphical representation of the cells of a matrix of correlations. The idea is to display the pattern of correlations in terms of their signs and magnitudes using visual thinning and

correlation-based variable ordering. Moreover, the cells of the matrix can be shaded or colored to show the correlation value. The positive correlations are shown in blue, while the negative correlations are shown in red; the darker the hue, the greater the magnitude of the correlation.

Heart diseases

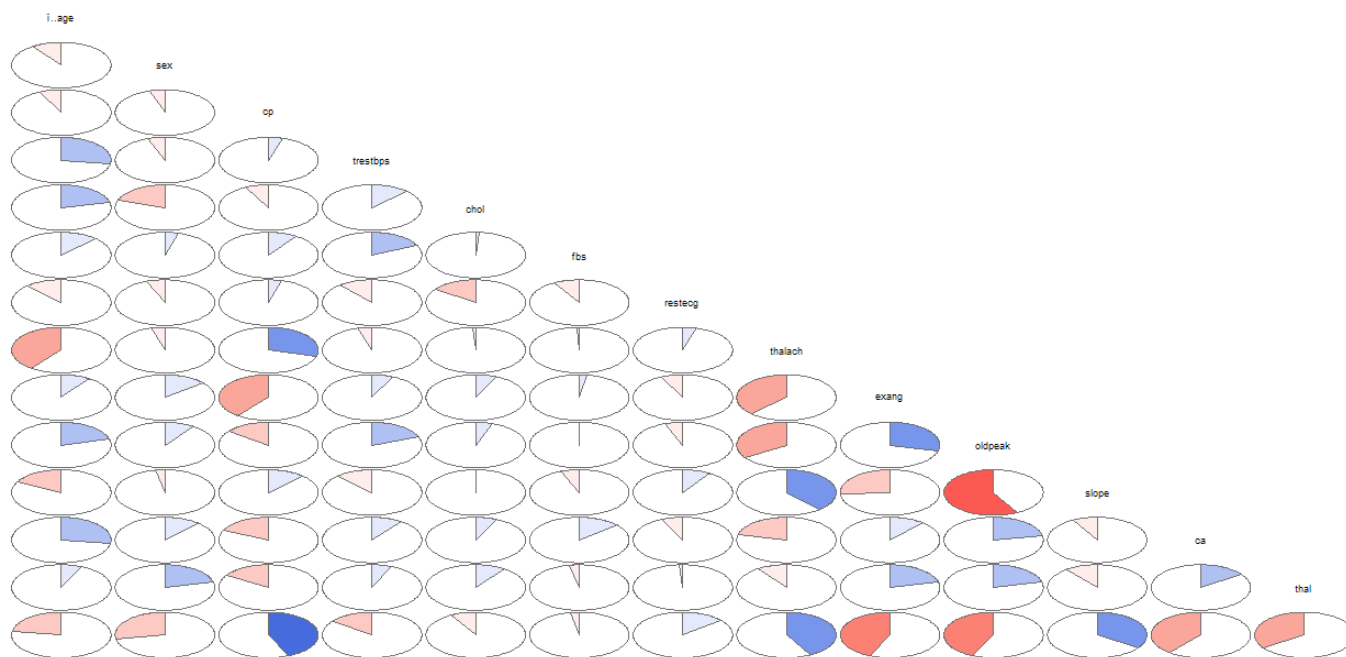


Figure 1. Matrix of correlations between variables

According to the logistic regression, the significant predictors are sex, chest pain, maximum heart rate achieved (thalach), exercise induced angina (ex-

ang), ST depression induced by exercise (oldpeak), number of major vessels (0–3) colored by flourosopy (ca), thalassemia (thal)

Table 2. – Logistic Regression for Heart Disease

	Estimate	Std. Error	z value	Pr(> z)	
1	2	3	4	5	6
(Intercept)	3.450	2.571	1.342	0.180	
age	-0.005	0.023	-0.212	0.832	
sex	-1.758	0.469	-3.751	0.000	***
cp	0.860	0.185	4.638	0.000	***
trestbps	-0.019	0.010	-1.884	0.060	.
chol	-0.005	0.004	-1.224	0.221	
fbs	0.035	0.529	0.066	0.947	
restecg	0.466	0.348	1.339	0.181	
thalach	0.023	0.010	2.219	0.026	*

	1	2	3	4	5	6
exang		-0.980	0.410	-2.391	0.017	*
oldpeak		-0.540	0.214	-2.526	0.012	*
slope		0.579	0.350	1.656	0.098	.
ca		-0.773	0.191	-4.051	0.000	***
thal		-0.900	0.290	-3.104	0.002	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

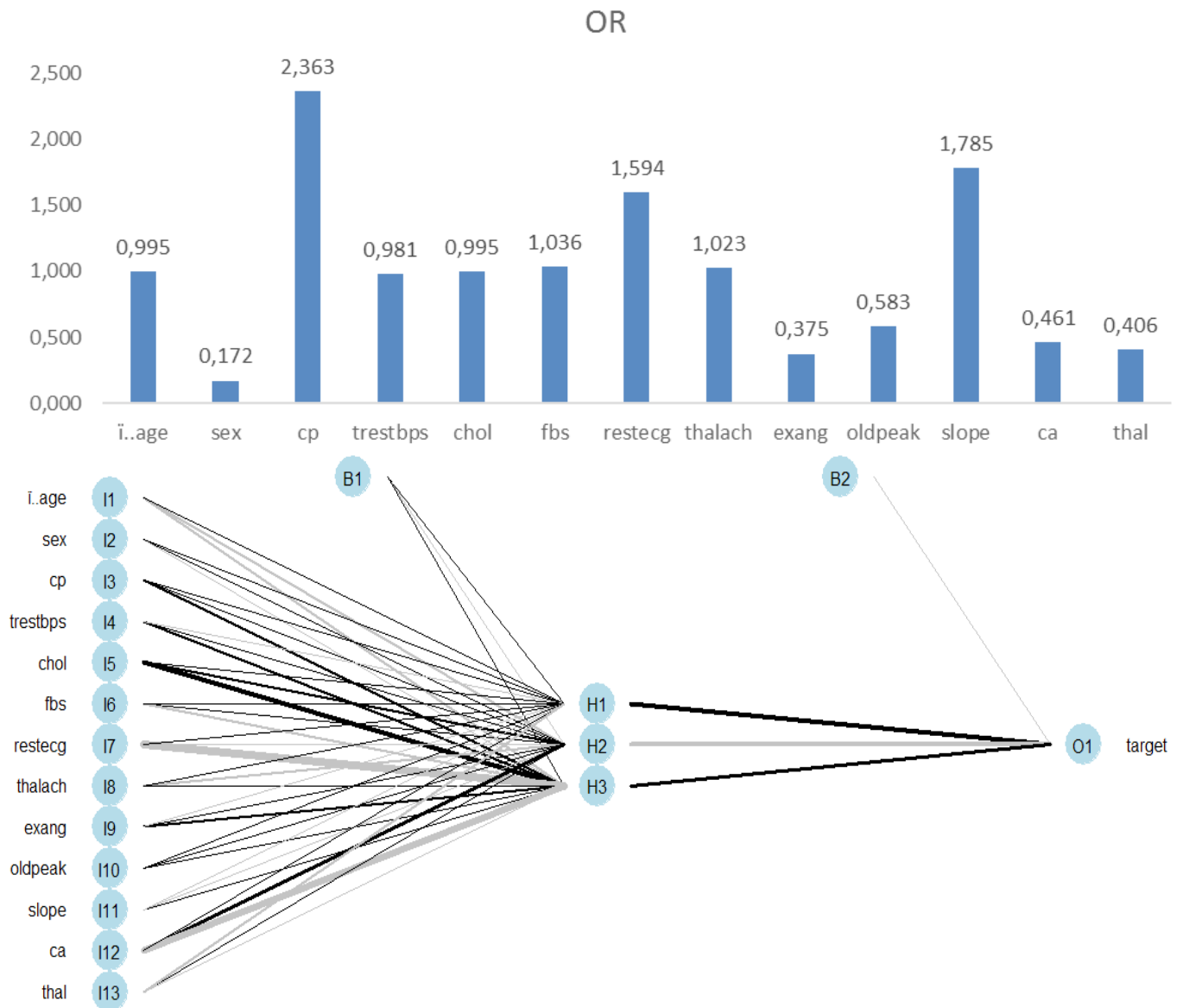


Figure 2. Artificial Neural Network in training sample

The male is 82.8% (1-0.172) less likely to have heart disease than the female. Patients with chest pain were 136% (2.363-1) more likely to have heart disease than the patients without chest pain.

The chance to have a heart disease increased by 2% when the maximum heart rate achieved increased by 1. Patients who had exercise induced angina were 62.5% (1-0.375) less likely to have heart dis-

ease. Patients who had ST depression induced by exercise were 41.7% ($1-0.583$) less likely to have heart disease. The chance to have heart disease decreased by 53.9% when the number of major vessels (0–3) colored by flourosopy increased by 1. Patients without thalassemia were less likely to have heart disease.

In above plot, line thickness represents weight magnitude and line color weight sign (black = positive, grey = negative). The net is essentially a black box so we cannot say that much about the fitting, the weights and the model. Suffice to say that the training algorithm has converged and therefore the model is ready to be used.

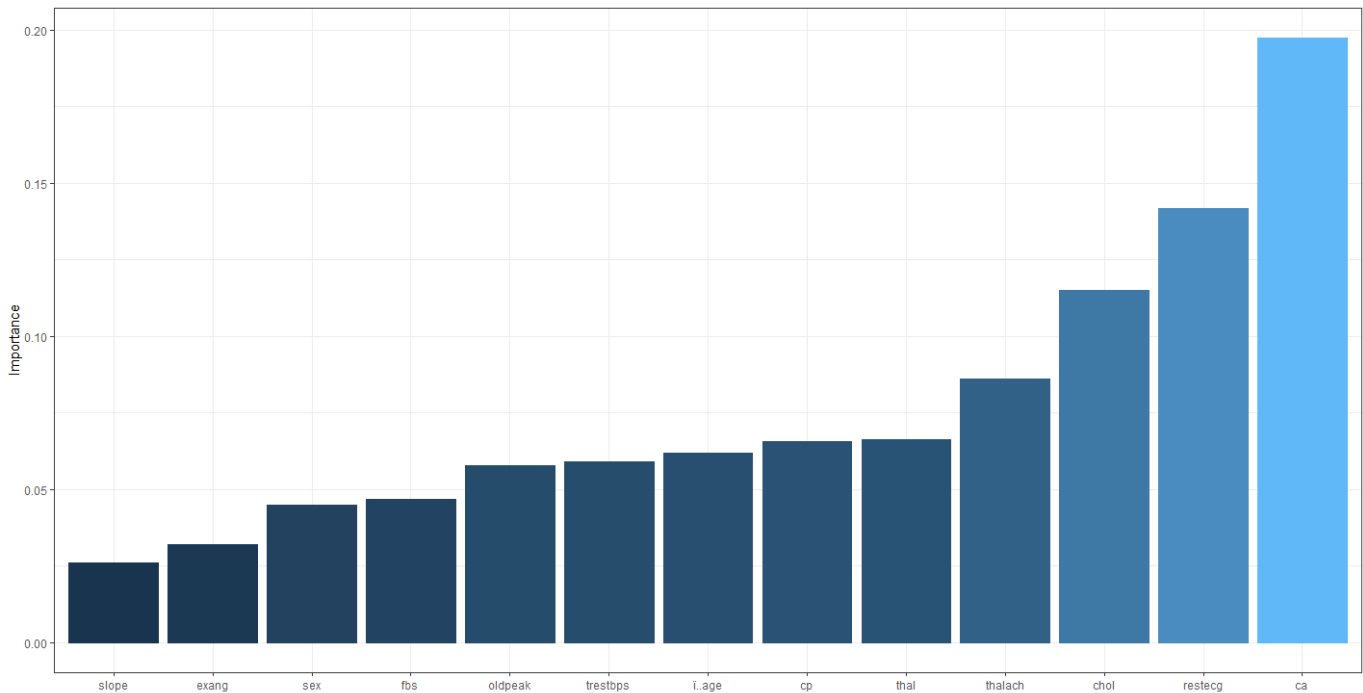


Figure 3. Variable Importance in Artificial Neural Network

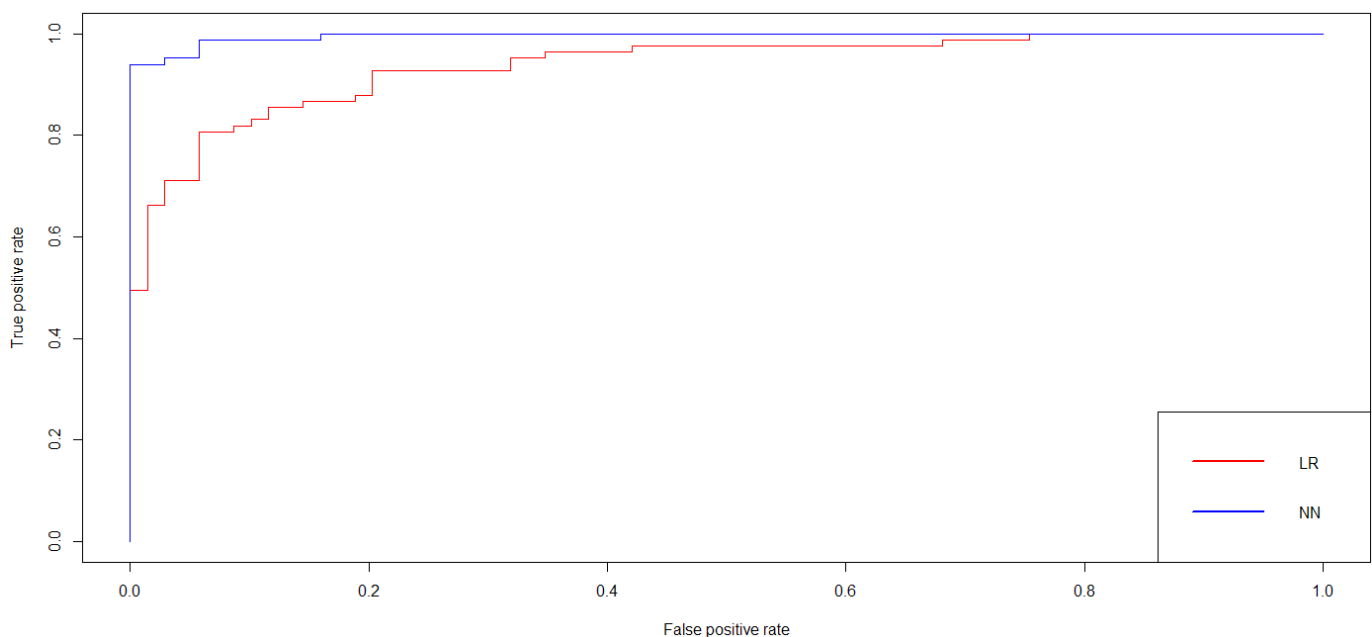


Figure 4. ROC in training sample for Logistic Regression (Red) vs Neural Network (Blue)

According to this neural network, the top 5 most important predictors were number of major vessels (0–3) colored by flourosopy (CA), resting electrocardiographic results (restecg), serum cholestoral in mg/dl (chol), maximum heart rate achieved (thalach), thalassemia.

For training sample, the ROC was 0.94 for the Logistic regression and 0.99 for the artificial neural network. Artificial neural network performed better clearly. However in testing sample, the ROC was 0.90 for the Logistic regression and 0.85 for the artificial neural network. Artificial neural network had worse performance.

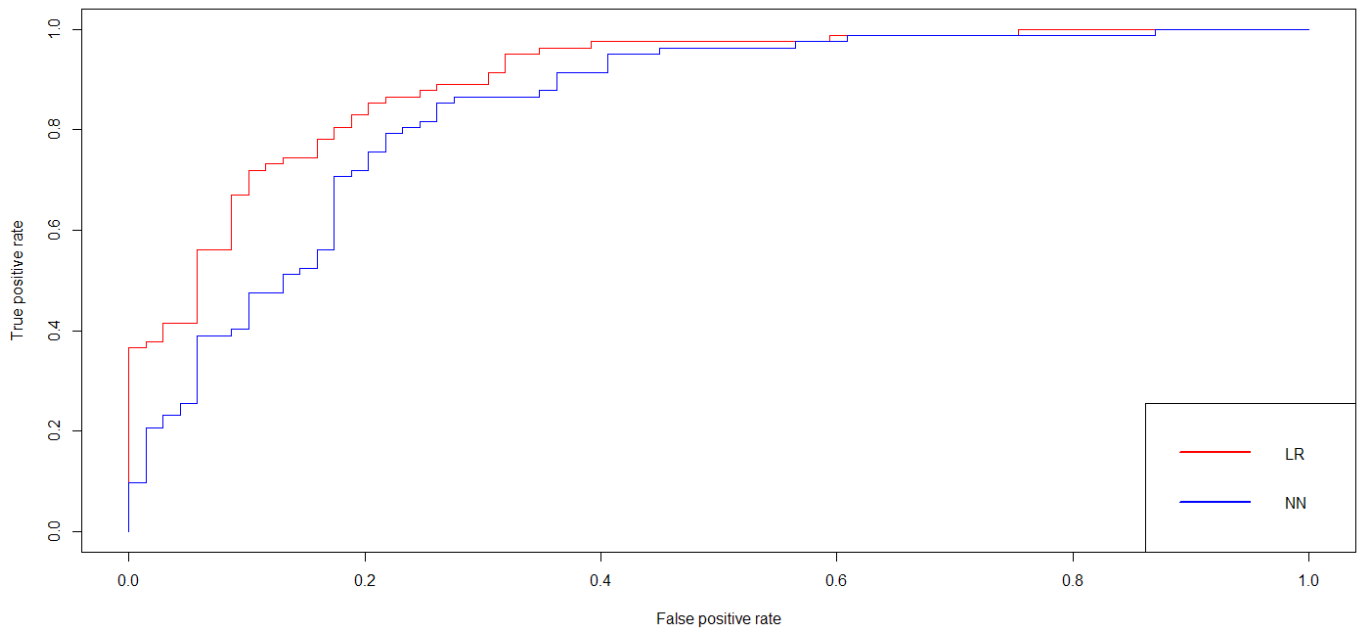


Figure 5. ROC in testing sample for Logistic Regression (Red) vs Neural Network (Blue)

4. Discussions

The male is 82.8% (1–0.172) less likely to have heart disease than the female. Patients with chest pain were 136% (2.363–1) more likely to have heart disease than the patients without chest pain. The chance to have a heart disease increased by 2% when the maximum heart rate achieved increased by 1. Patients who had exercise induced angina were 62.5% (1–0.375) less likely to have heart disease. Patients who had ST depression induced by exercise were 41.7% (1–0.583) less likely to have heart disease. The chance to have heart disease decreased by 53.9% when the number of major vessels (0–3) colored by flourosopy increased by 1. Patients without thalassemia were less likely to have heart disease.

There are limitations of this study. Some known factors which might predict of heart Disease were not available in this study, like family history of heart Disease. Further we did not test the external validity neither for logistic regression nor for the ANN. However, we did a comprehensive split-sample validation with both strategies. Future studies could use outside data and test the performance of the outputs from these two models in this study.

A predictive model would be an extremely useful tool to detect heart Disease. When the variables included in our tool are available, the risk could be easily predicted. Early detection and intervention could be made available for the people at high risk.

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Section 4. Pharmaceutical sciences

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CREATION METHODOLOGY OF A COMPUTERIZED KNOWLEDGE BASE “SCIENTIFIC RESEARCH ON PHARMACY INFORMATICS”

Abstract: The article uses the semantic analysis of published research in pharmacy informatics. We identified and analyzed seven priority areas of pharmaceutical informatics research, as well as methods, materials, and key innovations, the number of research authors and research centers was recorded. The results of the research can be used as the basis for creating a computerized knowledge base on pharmaceutical informatics.

Keywords: pharmacy informatics, computerized knowledge base.

Introduction. In the late 20th – early 21th century, research was conducted on the development and implementation of computerized pharmaceutical database. In particular, the research subject described the multifunctional aspects of the use of pharmaceutical products of various pharmacological groups for the treatment of various diseases. In 2008, we generalized basic principles of the construction of computerized pharmaceutical databases [1].

The general principles of the pharmaceutical information retrieval systems creation are based on the modern computer technology, the actual direction of development of which is the transition from computerized databases to computerized knowledge bases. Based on this trend, we in 2010 substantiated the idea of the need to create pharmaceutical knowledge bases [2]. They are conceptually classified in [3; 4].

We proposed the idea of practical modeling pharmaceutical knowledge bases in two partially interrelated areas. The first is the knowledge base, contain-

ing the totality of the current methodology, subject and materials of research, the results obtained for a single modern pharmaceutical science. The second is devoted to the results of substantiating the practical recommendations of the key requirements of health care overhaul in order to increase the use of modern effective pharmaceutical drugs. The relevant issues considered are the problems of complex treatment, the presence of concomitant diseases, as well as the rationalization of the personalized approach to the pharmacotherapy.

Objective: analytical investigation of scientific results in pharmacy informatics for the period from its advent (70s of the 20th century) to the present.

Materials and methods: abstracts of doctoral and candidate's theses in pharmacy informatics, written and defended in Ukraine (from 1978 to the present) and abroad by the students majoring in 15.00.01 “Drug technology, organization of pharmaceutical business and judicial pharmacy” (for

the given period time); monographs of Ukrainian authors on the pharmacy informatics, sections of polythematic monographs that mention pharmacy informatics (from 1979 to the present), monographs published abroad in the leading countries on the development of pharmacy informatics; actual reviews and publications on issues of pharmacy informatics published in leading pharmaceutical journals (from 1977 to the present); texts and theses of reports of scientists and pharmacists-practitioners on pharmaceutical information and pharmacy informatics in the materials of the Ukrainian pharmacists congresses, the totality of which covered the period from the first specialized publication in the materials of the II congress (1972) to the publications in the materials of the VIII congress (2016); official textbooks and educational media on pharmacy informatics used in higher educational institutions of Ukraine and textbooks on pharmacy

informatics of other countries. The article uses method of semantic analysis of published research in pharmacy informatics.

Results and discussion: The main materials used in our research were theses that use the methodology used in pharmacy informatics. We have found 80 theses that use this methodology. The main groups – 36 theses, written and defended in Ukraine (7 doctoral, 29 candidate theses) from 1978 to 2018. The initial stage of the research was a differential study of doctoral and candidate theses in the 20th c. and in the 21st c. with the subsequent integral assessment of trends in the selection of research areas for the entire period studied. Based on the results of the semantic analysis of the above materials, we have identified gradually formed priority research areas in pharmacy informatics. Table 1 has integrated data on the number of researches in the structure of theses in individual areas.

Table 1. The quantity and proportion of doctoral and master's theses in pharmacy informatics' various research areas

No.	Field	Quantitative parameters of each direction					
		20 th c.		21 th c.		Total	
		Q-ty	Proportion (%)	Q-ty	Proportion (%)	Q-ty	Proportion (%)
1.	Pharmacy informatics as a branch of science	4	9.5	0	0	4	4.8
2.	Pharmaceutical Information Languages	3	7.1	1	2.4	4	4.8
3.	Demand on pharmaceutical information	7	16.7	5	12.2	12	14.5
4.	Information support for pharmaceutical care and drug supply management	11	26.2	15	36.6	25	31.3
5.	Pharmaceutical information retrieval systems and databases	8	19.1	15	36.6	23	27.7
6.	Creation of a pharmaceutical information system	6	14.3	0	0	6	7.2
7.	Training of pharmacy informatics specialists	3	7.1	5	12.2	8	9.7

Data in (Table 1) demonstrate that in the 20th century the most relevant areas were “Information

support for pharmaceutical care and drug supply management” (4) and “Pharmaceutical information

retrieval systems and databases" (5). In the 20th c., no changes to the trend were found, which, including the latest dissertation research of 2016–2018, is also expected to be intact for further research.

Integration of both areas in certain theses should be noted. In particular, in 2008 the candidate's thesis included the creation of an original pharmaceutical knowledge base with a current purpose – the computerization of pharmaceutical control over the prescription of psychotropic drugs [5].

Today, a tendency on the increase in the number of theses in on training of specialists in pharmacy informatics is observed. It can be confirmed by the inclusion in the planned studies on the doctoral dissertation justification and its implementation to create a system of postgraduate training of pharmacists in pharmacy informatics, based on the "Pharmacy informatics" textbook issued in 2010 (Recommended by the Central Methodological Cabinet of Higher Medical Education of the Ministry of Health of Ukraine (Protocol No. 3 of December 22, 2009), recommended by the Ministry of Education and Science of Ukraine (letter No. 1/11–159 of January 20, 2010) [6].

The research methods were classified as: general scientific (including statistical), informatics (including coordinate indexing, creation of reference and information funds, information languages), as well as classical pharmaceutical (analysis of pharmaceutical drugs consumption and demand) and methods of pharmacy informatics (including automated analysis of the formulation; informatization of the formulation). A generalized system for constructing computerized databases, maintaining an electronic drug passport, and pharmaceutical diagnostics of electronic prescriptions is of interest in modern methodology [7; 8].

We have identified pharmaceutical drugs, supply of which may be optimized by using the methods of pharmacy informatics. They can be divided on the following groups by:

- various groups: immunostimulants, contraceptives, infusion solutions, herbal remedies, extemporaneous preparation;

- are used in certain areas of medicine: in dentistry, in urology, herbal medicines, used in gastroenterology, in otorhinolaryngology;
- used to treat certain diseases: dermatitis, bronchopulmonary diseases in children, diabetes, menopausal disorders in women, patients with mental disorders, herbal medicines used in gastroenterological and urological diseases, for the treatment of syphilis, gonorrhoea, HIV/AIDS, common infectious diseases in children; tuberculosis, epilepsy, arterial hypertension, juvenile rheumatoid arthritis;
- used to treat certain groups of the population (for various reasons): to treat older people, to treat children.

We will focus on the list of relevant pharmaceutical databases, which implementation in public health care of Ukraine was effective, and the corresponding theoretical rationale and experience in implementation are relevant for subsequent generations of research in pharmacy informatics:

- automated information retrieval system for glucocorticosteroids (experimental modeling) (Parnovsky B. L. (1978));
- automated analysis system of strict record keeping and storage of pharmaceutical drugs (Bilobrin S. A. (1983));
- conceptual and logical model, information support of the drug database (tested with antispasmodic and antihypertensive drugs) (Smirnova L. P. (1986));
- modeling of a computerized drug database by an example of antibiotics (Shelepeten L. S. (1988));
- modeling of an expert system for processing and dispensing drugs on a computer using the example of the bicillin antibiotic (Slaby M. V. (1992)).

Our research revealed that over the past 40 years, it was recorded that 46 specialists from 14 research centers devoted their research to the problems of pharmacy informatics in Ukraine.

When forming the structure of the pharmaceutical computerized knowledge base “Scientific research in pharmacy informatics” provided for by us, the organization or individual consumers can quickly receive the full range of materials, methodology, results of research in pharmacy informatics analyzed by us in this article.

Conclusion: The obtained results can be integrally used as the basis for research on the creation of a computerized knowledge base in other pharmaceutical sciences. In the long term, the modeled knowledge base “Scientific research in pharmacy informatics” will allow beginner researchers to have access to previous researches.

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