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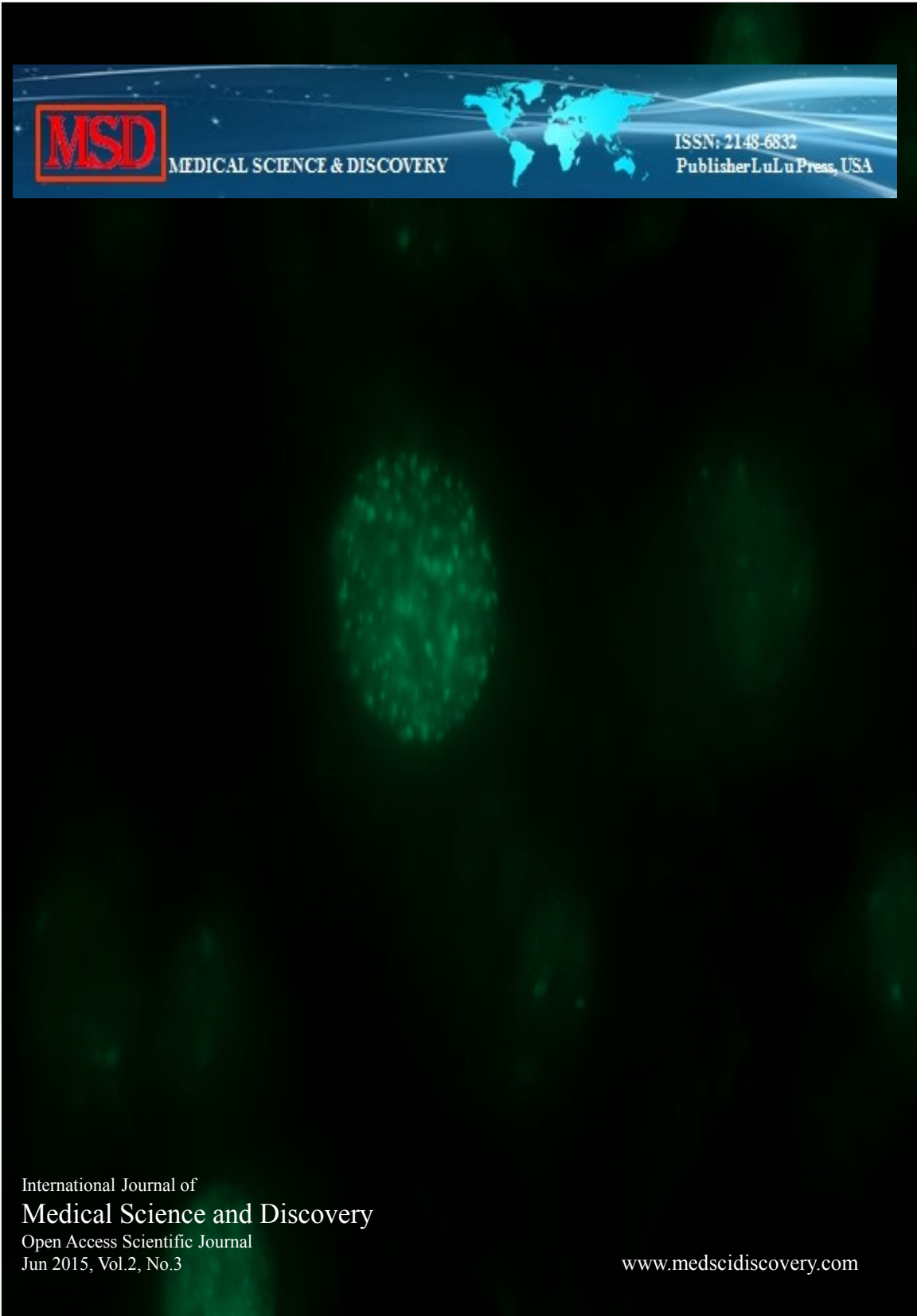

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Letter to Editor Doi: 10.17546/msd.46267

Rapid diagnostic tests used in first-step health services?

Huseyin Guducuoglu[1]

Dear Editor,

The term 'point-of-care test' (POCT) has been previously defined as a rapid diagnostic assay. The term has now been expanded to include any test that can be performed rapidly outside of a central laboratory environment (including home testing) even when the result might not directly impact on patient outcome (1). In recent years increased investment, technological advances, and greater awareness about the importance of reliable diagnostic tests has resulted in rapid progress. Rapid, reliable and affordable POC tests are requiring no equipment and minimal training (2).

Some rapid microbiological tests:

***Pneumococci*:** The diagnostic standard is still sputum or blood culture and the Gram stain. A pneumococcal rapid test can be used to increase diagnostic yield. A negative test does not reliably exclude pneumococcal pneumonia (sensitivity: 50% to 80%; specificity: 90%).

***Legionella*:** Legionella testing is appropriate in all unclear cases of pneumonia. A test is recommended each patient with pneumonia of unclear origin after admission to an intensive care ward, in epidemics, and when beta-lactam therapy fails. The diagnostic method of choice is antigen detection in the urine (sensitivity of 94% , specificity 99% to 100%).

***Influenza*:** There should be no routine testing for influenza antigens. This may be helpful in outbreaks or before the decision to start antiviral therapy. A test should be used which can differentiate between influenza types A and B (sensitivity 50% to 96% and specificity 72% to 100%).

***S. pyogenes*:** The rapid test for group A streptococci is now established as a routine component of diagnosis. Specific use markedly reduces unnecessary antibiotic use [sensitivity >85%, specificity (>95%;cf. culture: sensitivity 80% to 97%, specificity 100%)].

***S. agalactiae*:** The rapid test for group B streptococci is currently not sensitive enough to replace detection in culture. Routine use is not recommended [sensitivity (11% to 79%; cf. culture: 91%), specificity (91% to 100%; cf. culture: 89%)].

HIV: The rapid test for HIV has been fully developed in diagnosis and is just as reliable as conventional screening diagnosis with EIA. It can be used for patients who are difficult to reach, in regions with poor laboratory access, and in urgent decisions on possible prophylaxis after exposure or transmission [sensitivity (98% to 100%) and specificity (86% to 100%, one outlier 75%), even though the specificity is 99% to 100% in some studies]

Malaria (*P. falciparum*): The rapid test is now a very good alternative to light microscopy, although it has not replaced this as "gold standard". It can be used when light microscopy is not available. The rapid test has failed in isolated cases in spite of high parasitemia [sensitivity of the tests is usually over 90% and the specificity over 80%] (3).

The health system in Turkey can be divided into three groups as noted in the article (4); **First-step health services (Family health center):** The health system that can reach the individual and the families within the society as a whole, solve health problems of the community, protect the health, and provide home and outpatient therapy services. **Second-step health services:** The services provided for diagnosis and inpatient therapy of the patients. **Third-step health services:** Health services provided for the diseases requiring advanced examination and special therapy (3). In the provision of health services, the term "quality" may be defined as "diagnosis, therapy and care services. In several countries, a first-step physician who has received postgraduate training according to the international standards is designated as a "General Practitioner". A family physician will be required, apply actual screening, protect, provide therapy and follow-up protocols, and carry out multidisciplinary researches required by the first step (4). This physician must implement some simple tests in the first-step health service laboratory for diagnosis.

First-step health services are acting as primary health care services that use in-house microbiological rapid diagnostic tests (fast, reliable, simple) in the laboratory. This tests used in such health care facilities are limited and low applicability. Sensitivity and specificity of some of the rapid diagnostic tests (As seen above) are high. Such tests can be used easily in primary health care. If we give examples of them, *Streptococcus pyogenes* rapid test used for diagnosis of Group A Streptococcus (GAS), we can be easily avoided, likely to be carditis and accordingly complications in the future (in the diagnosis omitted). The cost of tests is extremely low. These tests are applicable in a very short time. Therefore, if rapid diagnostic tests being used in such institutions, many diseases can be easily eradicated with treatment and diagnosis can be made.

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Perioperative control of blood glucose

Serife Mehlika Kuskonmaz[1], Mustafa Arslan[2]

Abstract

This review mainly focuses on the management of type 2 diabetes in the preoperative setting with a special emphasis on intraoperative glycemic control. Some patients learn their diagnosis of diabetes just prior to the surgery. The prevalence of previously undiagnosed diabetes is reported to be 5.2-10% in literature. Treatment protocols must be tailored individually but evidence based approach in insulin administration and close monitoring of blood glucose are important in order to avoid both hyper and hypoglycemia

Key words: Diabetes Mellitus, Perioperative hyperglycemia, Preoperative care

Introduction

Prevalence of diabetes is increasing worldwide (1). Management of diabetes in the perioperative setting is a challenge to physician. There are many different treatment protocols applied and yet the target glucose value is a matter of debate among practicing doctors. So, regular, updated and evidence based renewal of data is necessary in the field. This review mainly focuses on the management of type 2 diabetes in the preoperative setting with a special emphasis on intraoperative glycemic control.

Perioperative hyperglycemia vs diabetes mellitus

Before going further with the perioperative management of diabetes, it is appropriate to explain the term: "perioperative hyperglycemia". This term refers to the hyperglycemia in surgical patients who are known to be non-diabetic (2). Hyperglycemia due to surgical stress is a result of a couple of metabolic changes in glucose utilization including release of counter-regulatory hormones and pro-inflammatory cytokines. Like diabetes, perioperative hyperglycemia is associated with adverse outcomes after surgery. Increased incidence of infections and increased mortality is reported in patients with perioperative hyperglycemia (3-5). Perioperative hyperglycemia is assumed to be associated with the degree of severity of the related stress. Further studies are needed to clarify if perioperative hyperglycemia directly contributes to the adverse outcomes and if its management prevents perioperative morbidities.

Hyperglycemia and perioperative adverse events

Association between hyperglycemia and variable perioperative risks is well defined (6). Clinical studies showed increased morbidity and mortality with hyperglycemia, after coronary artery bypass grafting (7-8). Diabetes is a well-known risk factor for postoperative infections (9), acute renal failure, ileus and prolonged hospital stay (10-11). These data show the importance of perioperative blood glucose control in diabetes. Current guidelines do not recommend routine preoperative screening for diabetes (12). Criteria for diabetes screening in general population are defined by American Diabetes Association (ADA). ADA suggests screening for all adults who are 45 years or older and for younger adults whose body mass index >25 kg/m^2 and have at least one additional risk factor. These risk factors are summarized in the table 1 (13).

Table 1. Summary of risk factors for diabetes

Physical inactivity
First degree relative with diabetes
High risk ethnicity
History of gestational diabetes
Hypertension
Dyslipidemia
Polycystic ovary syndrome
History of prediabetes
Conditions associated with insulin resistance (obesity, acanthosis nigricans)
Cardiovascular disease

Preoperative care of the diabetic patient

Some patients learn their diagnosis of diabetes just prior to the surgery. The prevalence of previously undiagnosed diabetes is reported to be 5.2-10% in literature (14,15). These patients seem to have a higher risk of perioperative mortality when compared to patients who are aware of their diabetes (16).

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Poor glycemic control is an established risk factor for perioperative morbidity. HbA1c is shown to be correlated with the risk. However it is not known whether surgery should be postponed until a better HbA1c value is achieved or not (17,18). It is difficult to estimate the real contribution of diabetes to perioperative morbidity since many diabetic patients have confounding factors like obesity or smoking history (19).

While preparing a diabetic patient to surgery, it is essential to take a detailed history of diabetes and its complications with a thorough list of medications. Guidelines advise prioritizing diabetic patient on the operating list (20). In general, it is suggested to continue the usual oral anti-diabetic medications until the day of surgery (21,22). Some oral anti-diabetics have specific effects so should be withheld at least 24 hours before surgery. Sulfonylureas are one of them. Sulfonylureas preclude the cardiac protection mechanism named "ischemic preconditioning" by closing the ATP dependent potassium channels (23). Metformin is supposed to increase the risk of lactic acidosis especially when renal dysfunction is present. So metformin is also stopped 24-48 hours before surgery. (24).

Dose adjustment is needed for patients who are already on insulin. Some authors suggest halving the dose of long acting insulin on the morning of surgery and changing the premixed insulin- which contains both short acting and intermediate acting insulin –to NPH insulin for that morning (25,26). If proper glycemic control is not achieved in a patient who is on oral anti-diabetics, basal-bolus insulin regimen is appropriate. In a study, 0.4-0.5U/kg/day of insulin is given to the patients undergoing general surgery, in divided doses; as 40-50% basal insulin and the remainder in pre-meal boluses and this regimen is found to be superior to sliding scale insulin (SSI) (27). SSI regimen is based on; not initiating insulin treatment until a predefined glucose value is exceeded. This method which was popular in seventies lost its importance by the introduction of new and superior methods for glycemic control. However it is still used in some institutions in a "non-evidence based" fashion (28, 29).

In short, withholding sulfonylureas and metformin a day before surgery and giving basal bolus insulin if necessary is suggested for good preoperative glycemic control.

How to control blood glucose intraoperatively?

Algorithms for perioperative control of blood glucose are variable. A traditional approach was to infuse insulin glucose and potassium named shortly as GIK (or Alberti regimen) (30).

Braithwaite algorithm uses a nurse implemented insulin infusion protocol guided by a standardized table which shows the rate of insulin infusion at a given blood glucose value (31). In this approach, 100IU insulin in 100mL 0.09% NaCl is infused together with 100-200mL/hour 5% Dextrose in water (D_5W). There are small studies showing the effectiveness of this approach (32,33).

Recently, variable rate intravenous insulin infusion is used to control blood glucose in the perioperative setting. In this approach, insulin is infused separately, ideally through an electronic infusion pump. This allows tight glycemic control and provides flexibility to the physician in changing doses (20).

United Kingdom guidelines advise implementing variable rate insulin infusion if glycemic control of the patient is not well. The authors suggest using 0.45% sodium chloride and 5% glucose with either 0.15 or 0.3% potassium chloride (as appropriate) as the substrate fluid of choice (20) together with insulin. Hourly measurement of capillary blood glucose to guide insulin infusion rate is recommended by the committee.

Studies looking into the intraoperative management of glucose are few. In a study, which looked into the association of intraoperative glucose values with predefined end points of death, infection, cardiac, neurological, renal, or pulmonary problems; every 20 mg/dl increase in glucose above 100 mg/dl was found to be associated with a 34% increase in experiencing a primary endpoint (34). A multivariate analysis in both diabetic and non-diabetic patients undergoing cardiac surgery showed that a high glucose level during the operation is an independent predictor of mortality in both groups (35). In another study, in which the effect of intraoperative glycemic control on cardiac bypass patients were evaluated, intraoperative insulin infusion was started if blood glucose exceeded 180mg/dl and infusion rate was adjusted according to the Portland protocol. Patients whose blood glucose exceeded 200mg/dl four times consecutively are defined as poor control group. The authors reported increased risk for severe postoperative complications in patients with poor glycemic control (36). Kohl et al, searched for the effect of intraoperative insulin infusion in to patients undergoing cardiopulmonary bypass surgery. They found a small but beneficial effect of insulin infusion on 30 day mortality in their study in which intraoperative insulin infusion was given to keep blood glucose<150mg/dL by the help of a standard protocol (37).

Administration of insulin glargine with dextrose solution for intraoperative glycemic control is tried in a small study and is found to be no different than GIK infusion (38). However changes in tissue perfusion and body temperature under anesthesia may result in unexpected variations in absorption of subcutaneous insulin. Indeed, insulin infusion is shown to be superior to subcutaneous injections in perioperative period in vascular surgery patients, regarding all cause death, myocardial infarction and congestive heart failure (39). Insulin infusion also

seems to decrease sternal wound infection and mortality in coronary artery bypass patients (40,41).

Target blood glucose values

The study by van Den Bergh et al was a landmark in diabetes care (42). This was a prospective randomized controlled study conducted in the surgical intensive care unit (ICU). A total of 1548 patients were enrolled in the study. The patients were grouped as intensive (target blood glucose: 80-110 mg/dL) and conventional (insulin started if only blood glucose exceeds 215 mg/dL and target blood glucose 180-200 mg/dL) treatment groups. At 12 months mortality rate was significantly lower in intensive group than in conventional group (4.6% vs 8% respectively). However this exciting mortality benefit was not repeated in a study carried out by the same investigators in medical ICU setting (43).

Intensive insulin therapy is further questioned when the results of NICE SUGAR study are reported. In this multicenter study, 6104 patients from medical and surgical ICU were randomized to strict (81-108mg/dL) and conventional (144-180mg/dL) glucose control groups. Mortality was higher in intensive group than in the conventional group (27.5% vs 24.9% respectively, odds ratio for intensive control, 1.14; 95% confidence interval, 1.02 to 1.28; P=0.02) Increased incidence of hypoglycemia might have contributed to increased perioperative morbidity and mortality.

A meta-analysis of five studies comparing intensive and conventional insulin regimens found similar mortalities in both groups (44). Three of these trials failed to show a mortality benefit of intensive insulin treatment (target blood glucose: 70-179mg/dL) where insulin was begun before, during, or immediately after surgery and was continued for less than 24 hours after surgery. Due to these conflicting data, guidelines about perioperative management of diabetes state different target blood glucose values. European Society of Cardiology (ESC) guidelines rely on the results of NICE SUGAR study and advice a target of 144 mg/dL in ICU setting (45). American College of Physicians suggests keeping blood glucose between 140-200mg/dL in diabetic patients in surgical ICU (46). On the other hand, United Kingdom guidelines define a target glucose of 6-10 mmol/L (108-180mg/dL) for the diabetic patient undergoing surgery (20).

Postoperative care of diabetic patient

After the operation, the patient's oral antidiabetics may be restarted, as soon as he/she is able to eat regular meals. For the patients on intravenous insulin infusion, basal bolus insulin regimen may be given postoperatively (47). Total daily dose can be estimated according to the total insulin dose infused in the preceeding 6-8 hours.

About half of the calculated dose may be given as basal insulin and the remainder may be divided into three to be given before meals as short acting insulin. If regular insulin is given as a short acting insulin, insulin infusion should not be stopped for 1-2 hours after the first dose to cover the period between the time of subcutaneous injection of bolus and its initiation of action. A summary of insulin types and their properties is given in table 2 (48). Management of patients in ICU is beyond the scope of this review and the reader may see other reviews discussing this subject (49).

Table 2. Insulin types and their properties

Insulin type	Onset of action	Peak effect	Duration of action
Regular	30-60 min	2 h	6-8 h
Lispro	5-15 min	60-90 min	3-4 h
Aspart	5-15 min	60-90 min	3-4 h
Glulysine	5-15 min	60-90 min	3-4 h
NPH	2-4 h	6-7 h	10-20 h
Glargine	1,5 h	Peakless	24 h
Detemir	1 h	Peakless	17 h

Conclusion

Proper management of diabetes in the perioperative setting is essential as effect of glycemic control on perioperative morbidity and mortality is well known. Treatment protocols must be tailored individually but evidence based approach in insulin administration and close monitoring of blood glucose are important in order to avoid both hyper and hypoglycemia. Further studies are needed to ascertain target blood glucose values in different surgical patients.

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Comparison of laparoscopic and abdominal methods of hysterectomy from patient's perspective

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Abstract

Objective: The aim of this study was to compare the postoperative pain and satisfaction of patients who underwent total laparoscopic or abdominal hysterectomy for benign gynecologic conditions.
Materials and Methods: This study was a prospective, randomized trial. A visual analogue scale and patient satisfaction score scale were used to evaluate the patients' postoperative satisfaction rates. Seventy-one patients who underwent total laparoscopic hysterectomy were compared with 68 patients who underwent total abdominal hysterectomy for benign gynecologic indications.
Results: The groups were similar with respect to age, race, gravidity and parity status, and uterine weight. Hospital stay; need for analgesic use; visual analogue scale pain scores at 12, 24, and 36 hours; patient satisfaction scores at 24 and 48 hours and one week; and blood loss were statistically lower in the laparoscopic hysterectomy group than in the abdominal hysterectomy group ($p<0.001$).
Conclusion: Laparoscopic hysterectomy was superior to abdominal hysterectomy in terms of short-term followup, postoperative pain, and satisfaction with the operation scar.

Key words: Abdominal Hysterectomy, Laparoscopic hysterectomy, Pain, Satisfaction, Visual Analog Scala

Introduction

More than 70% of hysterectomies are performed for benign surgical indications, including fibroids (33%), uterine prolapse (28%), menorrhagia (21%), and pelvic pain (3%) (1). The first total laparoscopic hysterectomy was reported in 1989; this procedure has been associated with shorter hospital stay, faster recovery, and fewer postoperative infections compared with abdominal hysterectomy (2). Advanced laparoscopic procedures are increasingly being utilized in gynecologic surgery (3); however, the abdominal hysterectomy technique is still performed in over 80% of operations (4).
The visual analogue scale (VAS) is a psychometric response scale that can be used in questionnaires. It is a measurement instrument for subjective characteristics or attitudes that cannot be measured directly. When responding to a VAS item, respondents specify their level of agreement with a statement by indicating a position along a continuous line between two end-points. This continuous (or analogue) aspect of the scale differentiates it from discrete scales. There is evidence showing that visual analogue scales have metric characteristics that are superior to those of discrete scales; thus, a wider range of statistical methods can be applied to the measurements (5). The patient satisfaction score (PSS) is a similar scoring system that calculates the satisfaction of the patient in a similar manner as VAS.
The aim of this study was to compare the short-term results of the laparoscopic and abdominal hysterectomy techniques and to compare the satisfaction rates of the patients with the operation scar.

Materials and Methods

This study was designed as a prospective, randomized trial. Seventy-one patients who underwent total laparoscopic hysterectomy were compared with 68 patients who underwent total abdominal hysterectomy for benign gynecologic indications. The indications for operation were fibroid, abnormal uterine bleeding, endometrial hyperplasia, and cervical intraepithelial neoplasia. Age, weight, and height of the patients were recorded just prior to going into the operating room. A metric body mass index (BMI) calculator was used to calculate the BMIs of the patients. Postoperative pain was measured on a VAS at 12, 24, and 36 hours postoperatively. The patients were asked to rate their pain on a scale of 1–10 (0=no pain; 2=mild; 5=moderate; 7=severe; 10=excruciating). The patients were also evaluated for their satisfaction with

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the abdominal operation scar on a PSS scale at postoperative 24 and 48 hours and one week. The patients were asked to rate their satisfaction with the operation scar on a scale of 1–10 (1=minimum and 10= maximum). All of the patients in the trial were evaluated by the same nursing staff.

Approval was obtained from an independent ethics committee, and the patients provided formal, informed consent prior to their participation in the clinical study.

Statistical analyses were carried out using PASW software, version 15.0 for Windows (SPSS, Chicago, IL). Student's t-test was used for statistical comparisons.

Results

The groups were similar in terms of age, race, gravidity and parity status, and uterine weight. The mean BMI value was statistically lower in the laparoscopic group than in the open abdominal group (27.65± 4.07 and 29.53± 3.90, respectively; p=0.006). There was no need to convert from laparoscopic to open abdominal surgery in any of the cases.

Hospital stay; need for analgesic use; VAS pain scores at 12, 24, and 36 hours; patient satisfaction scores at 24 and 48 hours and one week; and blood loss were statistically lower in the laparoscopic hysterectomy group than in the abdominal hysterectomy group ($p<0.001$). Although not statistically significant, the operation time was shorter in the laparoscopy group (Table 1). The indications for the operation are shown in Table 2.

Six (8.5%) patients in the laparoscopic hysterectomy group and 45 (66.2%) patients in the abdominal hysterectomy group had a history of abdominal operation ($p<0.001$). No serious perioperative complications were observed in either group. Only one uncomplicated wound infection occurred, in the abdominal hysterectomy group.

Discussion

Because hysterectomy is a frequent surgical procedure in gynecology, gynaecologists continuously research improved alternative techniques, and advanced laparoscopic techniques have been increasingly used in gynaecologic surgery over the past 20 years.

Previous studies have shown that laparoscopic hysterectomy is a comparable method to abdominal hysterectomy and results in less blood loss, shorter hospital stay, fewer wound infections, less pain, quicker recovery, and better short-term quality of life results. In those studies, mean operation time was longer in the laparoscopy groups (6, 7, 8). Another study that compared laparoscopic and abdominal hysterectomies found that the operation time was significantly longer in the laparoscopy group, estimated perioperative bleeding was greater in the abdominal hysterectomy group, and there was no difference in length of postoperative hospital stay between the two groups (9). Our study found that both operation time and hospital stay were shorter in the laparoscopic hysterectomy group. This difference might be due to the surgeons' experience with laparoscopic procedures in our study center. Although no major perioperative complications were observed in our study population, lower complication rates have been reported with laparoscopic procedures in the literature (10, 11).

There are two novel reports comparing laparoscopic hysterectomy with mini laparotomic abdominal hysterectomy. In a retrospective analysis, Kumar et al. found that mini laparotomy had a shorter intraoperative time and less blood loss, but a higher rate of major wound complications (12). Sirisabya et al. found similar postoperative pain and patient satisfaction results in the two groups, but a much higher postoperative complication rate in the laparoscopy group (13). These reports are not consistent with our findings. Although the differences might be related to the experience of the surgeons and the center or to the mini laparotomic incision in the abdominal approach, further studies are needed.

A study comparing laparoscopic and abdominal hysterectomies in terms of quality of life in a small study group found a significant treatment effect favoring laparoscopic hysterectomy in the RAND-36 scale for vitality (14).

Postoperative pain and the appearance of the operation scar are two valuable parameters for hysterectomy patients. In our study, postoperative pain and need for analgesic use were lower in the laparoscopy group, which is similar to results found in the literature. We also asked the patients what they thought of their operation scar, and the satisfaction rate was significantly higher in the laparoscopic group. We believe this is an important parameter when choosing the operative technique.

Conclusion

In conclusion, total laparoscopic hysterectomy is a remarkable alternative operation to abdominal hysterectomy in the management of benign gynecologic conditions when the operation team is experienced with laparoscopic surgery. Minimally invasive techniques could improve patient satisfaction and compliance with the operation.

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Table 1. Group statistics of the laparoscopic and abdominal hysterectomy patients

	Laparoscopy group (n=71)	Abdominal Hysterectomy group (n= 68)	p-value
Age	47,7± 5,13	47,44± 4,63	0,752
BMI	27,65± 4,07	29,53± 3,90	0,006
Gravidy	3,32± 1,39	3,73± 2,39	0,216
Parity	2,70± 1,17	2,78± 1,19	0,709
Uterine weight (g)	387,60± 113,64	385,51± 102,0	0,909
Preop. Hb level	10,99± 0,90	11,17± 0,87	0,252
Postop. Hb level	10,14± 0,91	10,08± 0,74	0,666
Hospital stay	3,21± 0,61	4,29± 0,95	**0,000**
Analgesic need	2,66± 0,97	6,60± 0,59	**0,000**
VAS 12 hours	5,12± 1,51	7,07± 1,15	**0,000**
VAS 24 hours	3,98± 1,11	5,57± 1,02	**0,000**
VAS 36 hours	3,28±0,99	4,14± 1,02	**0,000**
PSS 24 hours	8,43± 7,77	5,75± 1,02	**0,000**
PSS 48 hours	9,07± 0,54	6,55± 1,09	**0,000**
PSS 1 week	9,49± 0,53	7,05± 1,23	**0,000**
Blood loss (ml)	118,45± 79,16	212,64± 162,87	**0,000**
Operation time (min)	86,12± 18,97	93,19± 22,15	0,062

BMI: Body-mass index, p<0,005, VAS: Visual Analoque Scala, PSS: Patient Satisfaction Score

Table 2. Distribution of the operation indications of the patients

	Group		
Diagnosis	**Laparoscopy (n=71)**	**Abdominal (n=68)**	**Total (n=139)**
Myoma	31 (% 43,7)	31 (% 45,6)	62 (% 44,6)
Abnormal uterine bleeding (AUB)	14 (% 19,7)	14 (% 20,6)	28 (% 20,1)
Myoma+ AUB	18 (% 25,4)	18 (% 26,5)	36 (% 25,9)
Endometrial hyperplasia	7 (% 9,8)	5 (% 7,4)	12 (% 8,6)
Cervical Intraepithelial Neoplasia	1 (% 1,14)	0 (% 0)	1 (% 0,7)

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Dental sedation by anesthesiologists or dentists: a view from Turkey

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Abstract

Background: Except for conscious sedation (with nitrous oxide/oxygen), sedation of the dental patient has been applied by anesthesiologists in Turkey. But little is known about anesthesiology and reanimation specialist (ARS)'s and dental medical doctor (DMD)'s views about who should manage the dental sedation. Using a survey, Turkish ARSs' and DMDs' opinions regarding sedation of dental patients are examined.
Methods: A questionnaire was conducted to ARS and DMD participants that are active in clinical practices in Turkey. The questionnaire consists of 5 point Likert Scale which contains the options; strongly disagree (1), disagree (2), unsure (3), agree (4), strongly agree (5), and it aims to evaluate the perceptions of ARS and DMD participants, about 11 statements in relation to dental sedation which is performed by DMDs. The data was analyzed by SPSS 12.00 version for windows, and descriptive statistics was used.
Results: From 200 ARSs and 200 DMDs, a total of 400 questionnaires were obtained. The findings reveal that except for 4.5%, most of the ARSs had performed sedation or general anesthesia for dental treatment rarely or never, and half of the ARSs strongly disagreed with the statement that DMDs can provide moderate sedation during dental treatment. 10.5% of the ARSs strongly agreed, and 24% agreed, while 39.5% of DMDs strongly agreed, and 60.5% agreed with the statement "If dentists were trained to provide moderate sedation in the dental office, there would be less referral for dental treatment under general anesthesia".
Conclusions: Many ARSs in Turkey do not perform sedation of dental patients, but they suspect that DMDs are able to do it. Sedation applications for dental treatments are real necessities for handicapped or anxious patients and children. Guidelines for education and sedation management should be presented to clarify who should be in charge of managing sedation of dental patients.

Key words: Sedation, Survey, Dental treatment

Introduction

Accomplishment of dental treatment under sedation increases comfort of patients and dentists. Vasovagal reactions are less likely to occur if anxiety and fear can be controlled by sedation. Compared to application of local anesthesia alone, sedation together with local anesthesia may lead to serious complications such as respiratory depression. Potent general anesthetics, inhalational agents, sedatives, and opioids have the potential to depress respiratory function. Minimal or moderate sedation carries no serious side effects, if appropriate safe doses of anesthetics and monitorization technique are chosen. On the other hand, patient's intended level of minimal to moderate sedation carries possibility to drop into deep sedation or general anesthesia. General anesthesia or deep sedation has much more risks than conscious sedation, and deep sedation practices requires more training (1-5). Therefore, the health professional, who is in charge of performing dental sedation, must be clarified. At this point, the opinions of ARSs and DMDs become significant.

Anesthesiology and reanimation specialty is a branch of medical science. After completing medical school, physicians, to become a medical specialist in Turkey, further have to continue their medical education in anesthesiology and reanimation by completing 4 years of residency. General anesthesia and sedation (except conscious sedation with nitrous oxide/oxygen) are performed by only ARSs in Turkey. ARSs are primarily in charge of general anesthesia in medical patients and they are also responsible from sedation for imaging and procedural interventional purposes. Procedural sedation for dental treatment is also delivered by ARSs (6). Although full time working ARSs at dental office are not common; phobic, medically compromised, handicapped patients or discordant children may need sedation or general anesthesia during dental treatment (1, 7-10).

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There are some regions where ARSs are the sole providers of sedation practices in surgery units. There are also countries in which there are a few trained non-anesthesiologists who provide sedation in specified circumstances and locations, and in others, there are a number of non-physician professionals who provide sedation in diverse settings (1,7-10). The related legislation in Turkey allows dentists to perform only conscious sedation with N_2O (40%)/O_2 (60%).

Skills and practice standards in procedural sedation are a debated issue (1, 7-12). It is argued that insufficient number of ARSs influences the availability of sedation services. According to American Society of Anesthesiologinions of the participants about dentist-performed sedation were explored through 11 statements, each with 5 possible Likert Scale responses: strongly disagree (Score 1), disagree (Score 2), unsure (Score 3), agree (Score 4), and strongly agree (Score 5).

0% of the respondents. The total number of sedations and general anesthetics administered for the year was 115,940. In this survey, midazolam, fentanyl, diazepam, metohexital, propofol, ketamine, meperidine, nalbufin and thiopental were administered as IV anesthetics. The results of the survey showed that, for the 10-year period, 30 patients required to be transferred to the hospital 2 mortalities and two cases of long-term morbidity occurred.

Most practitioners recognize the importance of dental anesthesia education and training. However, there is a little consensus regarding the extent of anesthesia training that is appropriate for a dental school's pre-doctoral curriculum (15, 20, 21). Moore et al. presented the findings about preparedness and experiences with dental anesthesia of dental school graduates, in which they reported being least prepared in oral/intravenous sedation, and general anesthesia (20). For graduates currently in general practice, those who had participated in the anesthesia selective program reported being better prepared in most subjects relating to anesthesia and patient care. They reported that advanced training and increased clinical experiences in anesthesia may also be an effective means to better prepare graduates to assess medical histories, to manage medical emergencies, and to be willing to treat medically complex patients as well as patients with special health care needs.

Hicks et al. described what training programs in pediatric dentistry and dental anesthesiology were doing to meet future needs for deep sedation/general anesthesia services required for pediatric dentistry (11). Residency directors from 10 dental anesthesiology training programs in North America and 79 directors from pediatric dentistry training programs in North America were asked to answer an 18-item and 22-item online survey. Dental anesthesiology directors compared to 2, 5, and 10 years ago have seen an increase in the requests for dentist anesthesiologist services by pediatric dentists reported by 56% of respondents (past 2 years), 63% of respondents (past 5 years), and 88% of respondents (past 10 years), respectively. Predicting the future need of dentist anesthesiologists is an uncertain task, but these results show pediatric dentistry directors and dental anesthesiology directors are considering the need, and they recognize a trend of increased need for dentist anesthesiologist services over the past decade.

American Dental Association (ADA)'s guidelines for teaching pain control and sedation to dentists and dental student recommends that the pre-doctoral dental curriculum should provide the knowledge and skills necessary to competently administer minimal sedation to alleviate dental anxiety and to provide effective pain control (22).

For graduated DMDs from the university who prefer to go further education in oral and maxillofacial surgery specialty, have to complete the rotation program for three months in anesthesiology department in Turkey. In this period; specialty students are trained about general anesthesia, sedation and cardiopulmonary resuscitation and students are permitted to take elective courses about sedation as well.

On the other hand, for the basic dental students and for other specialties except oral and maxillofacial surgery, "anesthesiology rotation" is not covered by the compulsory courses.

Conclusion

Patients with dental fear or anxiety or medical compromises require sedation. Substantially minimal and moderate sedation during dental treatment can be performed by DMDs. But, minimal moderate or deep sedation are only terminological state. Patient's intended level of minimal to moderate sedation carries possibility to drop into deep sedation or general anesthesia. DMDs who apply sedation technique must be trained to manage the airway, insert an IV line and intubate a patient properly.

Furthermore, DMDs who administer sedation must be trained about basic and advanced life support

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Table 1: Opinions of the ARSs and DMDs about dental sedation procedures n (%)

	n=200+200	Strongly Disagree n%	Disagree n%	Unsure n%	Agree n%	Strongly Agree n%	p
DMDs are able to provide moderate sedation in the dental office	ARS (200)	100 (50)	32 (16)	36 (18)	32 (16)	0	X^2=150.020 p<0.0001
	DMD (200)	7 (3.5)	14 (7)	56 (28)	101 (50.5)	22 (11)	
In the DMDs office, moderate sedation should be provided by medical anesthesiologists	ARS (200)	0	32 (16)	0	68 (34)	100 (50)	X^2=135.295 p<0.0001
	DMD (200)	15 (7.5)	80 (40)	42 (21)	42 (21)	21 (10.5)	
Moderate sedation should be provided in a hospital setting	ARS (200)	3 (1.5)	3 (1.5)	28 (14)	115 (57.6)	51 (25.5)	X^2=259.987 p<0.0001
	DMD (200)	29 (14.5)	120 (60)	30 (15)	0	21 (10.5)	
DMDs are able to provide oral sedation	ARS (200)	21 (10.5)	86 (43)	26 (13)	54 (27)	13 (6.5)	X^2=129.617 p<0.0001
	DMD (200)	0	7 (3.5)	28 (14)	135 (67.5)	30 (15)	
DMDs are able to provide basic life support in an emergency situation	ARS (200)	13 (6.5)	10 (5)	30 (15)	106 (53)	41 (20.5)	X^2=4.674 p=0.322
	DMD (200)	5 (2.5)	7 (3.5)	35 (17.5)	108 (54)	45 (22.5)	
Oral sedation is a safe procedure for other practices such as radiological clinics	ARS (200)	13 (6.5)	57 (28.5)	23 (11.5)	87 (43.5)	20 (10)	X^2=27.780 p<0.0001
	DMD (n=193)	14 (7.3)	21 (10.9)	50 (25.9)	81 (42)	27 (14)	
A 96-h programs sufficient to enable a DMDs to provide inhalational sedation with nitrous oxide and oxygen at his/her office	ARS (200)	21 (10.5)	95 (47.5)	68 (34)	16 (8)	0	X^2=158.396 p<0.0001
	DMD (200)	0	14 (7)	71 (35.5)	85 (42.5)	30 (15)	
DMDs can provide oral chloral hydrate sedation for ASA 1 children	ARS (200)	0	75 (35.5)	53 (26.5)	52 (26)	20 (10)	X^2=49.583 p<0.0001
	DMD (200)	0	21 (10.5)	50 (25)	107 (53.5)	22 (11)	
DMDs can provide oral midazolam sedation for ASA 1 children	ARS (200)	0	112 (56)	37 (18.5)	51 (25.5)	0	X^2=85.903 p<0.0001
	DMD (200	0	28 (14)	49 (24.5)	112 (56)	11 (5.5)	
General anesthesia is the first choice for dental treatment of patients that do not cooperate with nonpharmacological behavior management methods	ARS (200)	32 (16)	78 (39)	32 (16)	21 (10.5)	37 (18.5)	X^2=115.756 p<0.0001
	DMD (200)	0	31 (15.5)	28 (14)	112 (56)	29 (14.5)	
If DMDs were trained to provide moderate sedation in the dental office there would be less referral for dental treatment under general anesthesia	ARS (200)	42 (21)	89 (44.5)	0	48 (24)	21 (10.5)	X^2=196.173 p<0.0001
	DMD (200)	0	0	0	121 (60.5)	79 (39.5)	

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The comparison of magnetic resonance urography with the combination of diuretic renal scintigraphy and urinary ultrasound in the diagnosis and follow up of ureteropelvic junction obstruction

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Abstract

Objectives: To evaluate the efficiency and reliability of MRU in diagnosis and follow up of children with UPJO.
Methods: The data of 64 patients with the diagnosis of primary UPJO were analysed. All patients underwent Anderson-Hynes pyeloplasty and pelvic reduction. Pre and postoperative results of renal pelvis AP diameter (RPAPD), separated renal function, renal transit time (RTT), and anatomical findings in USG and renal scintigraphy were compared with MRU findings to evaluate the possible differences and analyse the efficiency and reliability of MRU in the management of UPJO.
Results: All patients had unilateral hydronephrosis including 16 grade 2, 24 grade 3 and 24 grade 4. Pre- and postoperative RPAPDs in two techniques were also similar (P = 0.084, P = 0.576). Separated renal functions were evaluated by MRU with similar and sensitivity in DRS (P = 0.867). The comparison of mean pre and postoperative RTT results showed a significant improvement in mean postoperative RTT value (P = 0.024).
Conclusions: MRU has the potential to become the imaging study of choice in the diagnosis and follow up of obstructive uropathy, and it may have a more significant role in the management of UPJO in the near future.

Key words: MR urography, ultrasonography, renal scintigraphy, UPJ obstruction, pyeloplasty, children

Introduction

Currently there is no gold standard for assessing upper urinary tract obstruction, while the combination of ultrasound (USG), voiding cystourethrography (VCUG), and diuretic renal scintigraphy (DRS) is commonly used to investigate hydronephrosis in children (1). Magnetic resonance urography (MRU) is a more recent imaging concept in the evaluation of urinary tract. MRU has been used to investigate acute pyelonephritis and VUR, and determine renal function in children (2, 3). The advantage of MRU over other modalities is that anatomical and functional data can be obtained in one study without patient exposure to ionizing radiation. MRU can be used to guide management and assess outcome after pyeloplasty in children with ureteropelvic junction obstruction (UPJO). Superior spatial and contrast resolution is achieved with dynamic contrast enhanced MRU compared to that of USG or DRS (4). Analysis of renal function with MRU is comparable to that of DRS (4, 5). The quality of dynamic MR images enables additional functional parameters to be derived, such as renal transit time (RTT) (6). Moreover, single kidney glomerular filtration rate (GFR) can be estimated by dynamic contrast enhanced MRU (7).

The aim of this study was to analyze the efficiency and reliability of MRU in diagnosis and follow up of children with UPJO. Pre and postoperative results of renal pelvis AP diameter (RPAPD), separated renal function, RTT, and anatomical findings in USG and ^{99m}Tc MAG3 renal scintigraphy (DRS), which are still used as gold standard in the diagnosis of UPJO, were compared with MRU findings to evaluate the possible differences

Materials and Methods

Between January 2005 and 2009, a total of 64 patients who were presented to Urology Clinic of Ibni Sina Hospital, School of Medicine, Ankara University, with the diagnosis of primary UPJO were included. A detailed clinical history, physical examination, blood urea-creatinine level, urine analysis, direct urinary system X-ray, renal USG, and DRS were performed. Renal size (longitudinal and transverse), RPAPD, and the hydronephrosis level were measured by USG. Separated renal function (SRF) was determined by DRS. All patients underwent MRU imaging to separately evaluate

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kidney size, RPAPD, separated renal function (SRF in MRU = differential renal function: DRF), and RTT. The alteration higher than 5% in separated renal functions, which was measured by DRS (SRF) and MRU (DRF), was considered significant. Subsequently, Anderson-Hynes pyeloplasty and pelvic reduction were performed in all patients. The indications for surgery were recurrent flank pain, increasing level of hydronephrosis in elder children. For neonatal hydronephrosis and RPAPD greater than 30 mm and/or impaired DRF lower than 40% and progression of hydronephrosis level were considered as operation criteria. At sixth month postoperatively, USG, DRS, and MRU were repeated to evaluate postoperative improvement of UPJO. During USG analysis, there was no need of sedation. DRS was performed after USG analysis. All patients and families were informed about DRS application. Initially, hydration was performed with 15 ml/kg 0.9% NaCl solution until 30th minute before starting the test. Bladder in older children was emptied just before DRS study. Sedation was administered only to younger children (generally ≤ 5 years).

Patient was fixed to the application table by two belts covering upper and lower parts of the body, and the parents stayed near the children during to whole test to calm down them. 99mTc MAG3 was administered to all children with the dosage of 50 µCi/kg (1.85MBq/kg), minimum 1 mCi intravenous bolus injection (8). Subsequently, 1mg/kg (maximum of 20 mg) furosemide was intravenously injected at 15th minute. MRU was performed under 1.0 T MR Unit (Hispeed, GE Medical Systems) with a body coil (body coil) by using T2-weighted (HASTE) technique 2-3 days after DRS to decrease the artefacts that might occur related to DRS testing. Patient was placed in supine position and kept breathing during application. Urination was inquired before the shooting. RPAPD, obstruction level, DRF, renal anatomy, and RTT were determined by MRU testing. While reconstruction was being made, raw images were also taken into consideration. Sudden change in ureteral diameter was accepted as the level of obstruction point. The sensitivity and specificity of MRU in the diagnosis of UPJO were analyzed.

In addition, before and after surgery results of AP diameter, SRF on DRS, DRF on MRU, RTT, and anatomical findings on USG and DRS were compared with MRU findings to evaluate the possible differences.

Statistical analysis

For statistical analysis SPSS version 11.0 (SPSS, Inc, Chicago, IL, USA) was used and a P-value of 0.05 was considered significant. The results were measurable and the sample size had adequate capacity. The pre and postoperative data were compared by using Pearson regression and correlation analysis.

Results

The sample included 32 boys and 32 girls with a mean age of 7.2±1.8 years (range 2 months-11 years). The diagnosis of UPJO was performed by the combination of USG and DRS. All patients had unilateral hydronephrosis and the level of the hydronephrosis was found grade 2 in 16, grade 3 in 24 and grade 4 in 24 patients according to the society for fetal urology. Only four patients had UPJO on the right side (4/64). Although no patient was suspected to have a crossing vessel during USG testing, it was determined by MRU in two patients.

The mean preoperative pelvic RPAPD was 32.7 mm ± 11.2 mm on USG and 33.2 mm ± 10.8 mm on MRU, respectively. There was no statistically significant difference between two results (P = 0.084). Postoperative RPAPDs were 19.5±6.4 mm in USG and 19.4±5.9 mm on MRU. Postoperative RPAPDs in two techniques were also similar (P=0.576). RPAPD was reduced approximately 13.5 mm postoperatively, and it was related to perform pelvic reduction during pyleloplasty.

All patients underwent similar rate of pelvic reduction during pyleloplasty and measurements were performed on the postoperative 6th month as we had previously shown that the level of hydronephrosis became more stable. According to DRS results, 40 patients (62.5%) had no significant changes, 16 patients (25%) had 5% or more improvement, and 8 patients (12.5%) had deterioration in SRF after surgery.

The evaluation with MRU showed that 36 patients (56%) were with no significant changes, 20 patients (31.5%) were with 5% or more improvement, and 8 patients (12.5%) were with deterioration in DRF after the operation. In 4 patients, 3% improvement was found in SRF by DRS, whereas 5% improvement was seen in DRF by MRU. Except for that patient, the results detected by DRS were in accordance with MRU results.

The mean values of SRF detected by DRS before and after the operation were 33.3% and 32.5%, respectively. Whereas the mean DRF values before and after the surgery on MRU were 32.9% and 31.5%, respectively (Figure 1)

Figure 1: Mean values of separeted renal function (on DRS) and differential renal function (on MRU) before and after the operation.

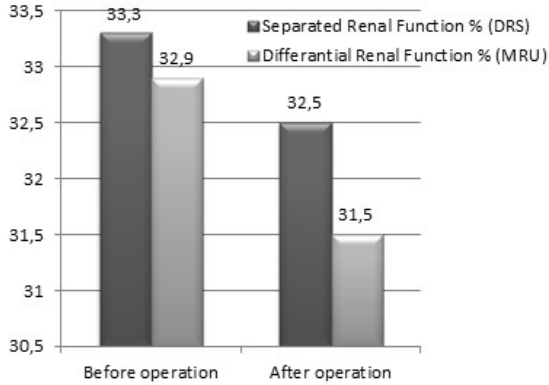
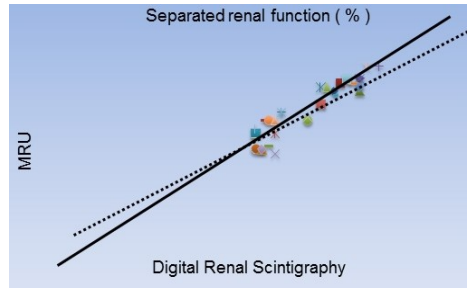
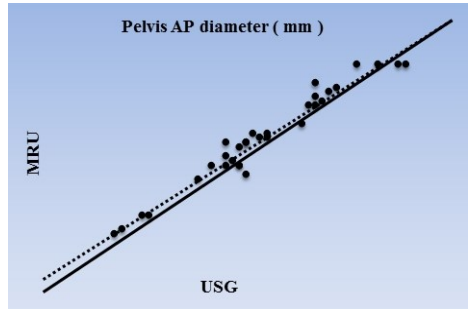


Figure 2: The demontration of correlation curve of separated renal function(SRF) that was obtained by DRS and differential renal function (DRF) that was obtained by MRU.



Correlation was obtained by using Pearson correlation- regression analysis and regression equation of; DRF (on MRU) = 7.359 + 0.797 × SRF (on DRS). Similarly, there was a significant correlation between RPAPDs, which was preoperatively obtained by USG and MRU (P = 0.076)

Figure 3: The demonstration of correlation curve of renal pelvis AP diameters, which were obtained by renal USG and MRU.



The correlation was determined by using Pearson correlation- regression analysis and regression equation of; RPAPD (on MRU) = 1.828 + 0.959 × RPAPD (on USG).

There was no statistically significant difference between the separated renal function results before and after the surgery in two methods (P:0.867). Preoperative and postoperative RTT values were determined by MRU, and compared.

Eight patients (12.5%) had RTT < 4 minutes that was accepted as normal UPJ. 20 patients (31%) were with RTT between 4 and 8 minutes that was accepted as mild UPJO. 36 patients (56.5%) had RTT > 8 minutes, which was accepted as significant UPJO. The mean preoperative and postoperative RTT were 17.7± 5.9 min (7-32 min) and 11.3±6.5 min (3-30 min), respectively. The comparison of them showed a significant improvement in mean postoperative RTT value (P=0.024). Although it was observed that 60 patients out of 64 (93.75%) had improvement in RTT value, just four were postoperatively stable in terms of RTT. Both of them were in 'normal UPJ' group with a RTT < 4 minutes preoperatively. These patients underwent surgery due to severe recurrent pain that was diminished in all postoperatively.

There was a significant correlation between DRF on MRU and SRF on DRS
(P=0.184), (Figure 2).

Discussion

Many developments occurred in radiological evaluation of renal obstruction during last 10 years. Previously, the first choices of diagnostic tests in the management of suspicious ureteropelvic junction obstruction (UPJO) were intravenous urography (IVU) and antegrade pressure flow (Whitaker) tests. After the technological developments, an increased number of diagnostic tests including USG, DRS, and MRU were started to be used in the evaluation of hydronephrosis. Although these diagnostic tests provide only well anatomic visualization or good functional evaluation, combined information can simultaneously be obtained just by MRU. There are still no accepted gold standards in the evaluation of renal obstruction (1).

The diagnosis of UPJO on MRU is seen as dilatation of renal pelvis and/or collecting system with ureteral obstruction and the combination of atrophy of renal pyramids and medulla (9). Preoperative determination of the presence of a crossing vessel that can change the surgical management style is very important. Previous studies reported that the visualization rate of a crossing vessel by USG was 39% (10, 11). In the present study, a crossing vessel, which could not be diagnosed by USG, was manifested by MRU.

MRU provides much more data than DRS in the evaluation of antenatal hydronephrosis. Furthermore, it gives pretty much data about the dilatation of ureter and bladder in patients with suspicious vesicoureteral reflux or infravesical obstruction. Another important data, which was provided by USG in the management of hydronephrosis, was dimension of renal pelvis. Nevertheless, USG alone can give faulty results in cases with intrarenal pelvis, therefore the management of hydronephrosis, which is a dynamical problem, is required to use other management procedures that must be simultaneously performed with USG. Whereas USG and DRS are separately performed in current practice, they get the clinicians' decision more difficult in some conditions with their conflicting findings.

Both of USG and DRS results may be affected by hydration status and patient may not have the same hydration status during USG and renal scintigraphy. This deficiency may cause to have faulty results.

Nevertheless MRU can simultaneously obtain anatomical and functional evaluation, thus there will be no different and/or faulty results, which can occur because of the different hydration status during the detection.

The detection of pelvicaliceal dilatation level by USG may give faulty results, wherefore USG evaluation may be affected by hydration status, intravesical volume, and position of patient. Quality of USG examination can also be affected by intestinal gas, thus the conjunction point of ureter to renal pelvis cannot be clearly shown.

The evaluation of renal anatomy and dimension of renal pelvis on MRU may not be influenced by patients' position, and MRU can also obtain more detailed anatomical images. Thus, a more detailed detection can be performed in course of ureter, and the requirement of preoperatively performing retrograde pyelography is removed. Beside its simple applicability, USG has a disadvantage of being influenced by individually interpretation of radiologist. MRU images can subsequently be pressed and analyzed. In current practice, while USG and DRS are simultaneously evaluated in the diagnosis of UPJO, they cannot be simultaneously performed.

A single detection on MRU may discriminate an obstructed pelvis from non-obstructed system, because it additionally provides the evaluation of RTT with morphological images (6). The description of obstruction on MRU is defined as decreased and retarded contrast media infiltration in calyxes and ureter beside the anatomical image of an obstruction. This description can objectively be performed by calculating RTT and DRF. MRU manifests better findings in the diagnosis of UPJO.

In a previous study, Chu and et al. analyzed 8 children with unilateral hydronephrosis and a decreased renal function in the range of 30% to 40% by MRU and DRS. DRS revealed drainage in 3 dilated systems and obstruction in 5, while MRU showed drainage in 7 systems and obstruction only in 1. The 18 months follow up in 7 patients with normal urine drainage on MRU showed no deterioration in renal function or progressive hydronephrosis. Two cases those had an obstruction on DRS and drainage on

MRU underwent antegrade pyelography, and it was found that there was no evidence of UPJO on antegrade pyelogram. Thus, DRS tended to overestimate obstruction (12).

Previously, it was reported that USG and renal scintigraphy might be misleading in clinical follow up [12]. RTT can be helpful in clinical follow up. In the present study, RTT was evaluated before and after the operation, and it was found that RTT significantly decreased after surgery. Nevertheless, RTT was much more in accordance with other parameters even in the clinical follow up of the patients who had no improvements on DRS postoperatively.

Single kidney glomerular filtration rate (GFR) can be estimated by creating Rutland-Patlaks' graph with the findings on MRU. This data is useful in patients with bilateral renal disorder or unilateral disorder in solitary kidney, and MRU has a distinct advantage over DRS with this. In addition, RTT can independently show the separate function of each kidney in bilateral renal disorders, therefore it can provide more objective and helpful results. It is the lack of our study that single kidney GFR could not be calculated because of technical insufficiencies. Some previous studies reported that DRF on MRU was in correlation with SRF on DRS [4,5]. We have also determined a significant correlation between DRF and SRF, and our data suggest that each procedure is useful in the determination of renal function.

Our study allowed us to compare and evaluate the pre and postoperative results by two different visions, thus its results were important and beneficial for clinicians. Hopefully, this study can provide additional data to pediatric urologist as the postoperative follow up of operated UPJO patients, which is still controversial.

MRU has also some limitations beside its advantages. There are still no completely accepted standardized values and formulas for determining renal function and classifying renal drainage. MRU is generally required sedation and monitorization in most of the children.

Besides, Rutland-Patlaks' formula, which is used for the determination of GFR, was created just for adults, and it is not modified for children yet. The high prices of MRU and no existence in all medical centres are also important limitations of this procedure. Nevertheless, the comparison of total cost between other diagnostic procedures and MRU especially in the analysis of complicated cases showed that MRU had commonly similar cost and sometimes it had the cost advantage.

On the other hand, the required training period to learn the evaluation of MRU is longer than other investigation procedures. The limitations of MRU compared to that of other procedures can be eliminated by its higher quality and more detailed and comprehensive results.

Conclusion

After the development of MRU in the late 1980s, it was hailed as being an excellent diagnostic tool for differentiating among pediatric urological diseases with the advantages of MRU, which include no use of ionizing radiation, image acquisition with higher contrast material that is not affected by bowel motion or bowel gas, and image quality is independent of renal function. The approach to UPJO using MRU provides simultaneous functional and anatomic evaluation of renal parenchyma in one study. With MRU we are able to determine pathophysiological differences in children with UPJO that are occult on USG and DRS. We believe that the limitations of MRU compared to that of USG and DRS is offset by the quality and comprehensiveness of the information obtained.

In addition, MRU has the potential to become the imaging study of choice in the diagnosis and follow up of obstructive uropathy, and it may have a more significant role in the management of this disorder in the near future

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All authors state that there is no conflict of interest

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Effect of propofol and memantine on erythrocyte deformability in diabetic rat model

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Abstract

Objectives: In this study we aimed to investigate the effect of diabetes on erythrocyte deformability (ED) and whether it can be changed by an NMDA antagonist propofol or an NMDA agonist, memantine, Several clinical studies showed that ED decreases in diabetes. Recent studies showed that erythrocytes have N-methyl-D-aspartate (NMDA) receptors (NMDA Rec) on their membrane.
Methods: Thirty rats were allocated to five groups containing 6 rats each. Memantine was given for 30 days to diabetic rats in one group (group DM) single dose propofol injection is added to this regimen in another group (group DPM) another group received propofol only (group DP). The remaining groups were controls (group C) and diabetic controls (group D). ED was measured in each group and compared
Results: The deformability index was significantly increased in the diabetic rats (p<0.0001). However, it was similar in Group DC and DP (p=0.551), Group DC and DM (p=1.000), Group DC and DPM (p=0.176).
Conclusions: Neither NMDA antagonist propofol nor NMDA agonist memantine affected the altered red cell rheology in diabetic rat model.

Key words: Memantine, propofol, erythrocyte deformability, diabetes mellitus, rat

Introduction

Erythrocyte deformability (ED) facilitates blood flow through the circulation in vessels of variable diameter and enables effective exchange of gas and metabolic products in capillaries (1). ED is a function of; 1) red cell geometry, 2) viscosity of intracellular fluid, 3) erythrocyte membrane (2).

Several clinical studies showed that ED decreases in diabetes (3-5). Diabetes affects erythrocyte metabolism and function through different ways. Metabolic changes in erythrocytes lead to oxidative stress which is shown to affect erythrocyte shape in *in vitro* studies (6). Diabetes also affects composition of the lipid bilayer in cell membrane by increasing cholesterol and more importantly phospholipids thereby decreasing the cholesterol to phospholipid ratio (7,8). Glycosylation of the cytoskeletal proteins is supposed to affect the viscoelastic properties of the membrane (9,10).

Recent studies showed that erythrocytes have N-methyl-D-aspartate (NMDA) receptors (NMDA Rec) on their membrane. Activation of NMDA Rec resulted in volume changes, changes in cytoskeleton and nitric oxide synthesis (11).

In this study we aimed to investigate the effect of diabetes on ED and whether it can be changed by an NMDA antagonist propofol or an NMDA agonist, memantine.

Materials and Methods

Animals and Experimental Protocol

This study was conducted in the Animal Laboratory of Gazi University upon the approval of the Experimental Animals Ethics Committee of Gazi University. All of the procedures were performed according to the accepted standards of the Guide for the Care and Use of Laboratory Animals.

In this study, 30 male Wistar Albino rats weighing between 250 and 300 g were used. The rats were kept under 20-21 ^{o}C at cycles of 12-hour daylight and 12-hour darkness and had free access to food and water until 2 hours before the anesthesia procedure. The animals were randomly separated into five groups, each containing 6 rats. Groups were as follows:

Diabetes was induced by a single intraperitoneal injection of streptozotocin (Sigma Chemical, St. Louis, MO, USA) at a dose of 55 mg.kg^{-1} body weight. The blood glucose levels were measured 72 hours following this injection (GlucoDr Super Sensor, Allmedicus, Korea). Rats were classified as diabetic if their fasting blood glucose (FBG) levels exceeded 250

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$mg.dl^{-1}$, and only animals with FBGs of > 250 $mg.dl^{-1}$ were included in the diabetic groups (diabetes only, diabetes plus propofol and diabetes plus memantine after propofol). The rats were kept alive 4 weeks after streptozotocin injection to allow development of chronic diabetes before they were exposed to propofol.

Thirty rats were allocated to 5 groups. The groups were as follows:
Group C (Control),
Group D (Diabetic),
Group DP (Diabetic+Propofol),
Group DM (Diabetic+Memantine),
Group DPM (Diabetic+ Memantine+Propofol).

In group DP (n=6) 150 $mg.kg^{-1}$ of propofol (Propofol 1% Fresenius 20 mL) was injected intraperitoneally. In group DM (n=6) 20 $mg.kg^{-1}$ of memantine was given (Memantine hydrochloride, Sigma $mg.ml^{-1}$) for 30 days. In group DPM (n=6) rats were given 20 $mg.kg^{-1}$ of memantine (Memantine hydrochloride, Sigma $mg.ml^{-1}$) for 30 days and at the last day of experiment 150 $mg.kg^{-1}$ of propofol was administered, while rats in group C-control (n=6) and group D-diabetic control (n=6) received intraperitoneal physiological saline.

All rats were anesthetized with intraperitoneal ketamine 100 $mg.kg^{-1}$ at the end of the experiment. Rats in DP and DP + memantine groups were given ketamine specifically 30 minutes after propofol administration and euthanized to collect blood samples. The abdomen was shaved and each animal was fixed in a supine position on the operating table. The abdomen was cleaned with 1% polyvinyl iodine and when dry, the operating field was covered with a sterile drape and median laparotomy was performed. Blood samples are collected from the vessels in the abdominal cavity. Heparinized whole blood samples were used to prepare erythrocyte packs. Deformability measurements were done by erythrocyte suspensions with 5% hematocrit in phosphate buffered saline buffer.

Deformability measurements

Blood samples were taken carefully and analyzed immediately to avoid hemolysis. Collected blood was centrifuged at 1000 rpm for ten minutes. After removal of serum and buffy coat on erythrocytes, isotonic PBS buffer was added to collapse erythrocytes and this mixture was centrifuged at 1000 rpm for ten minutes. Liquid on the upper surface was discarded. The mixture is washed three times to obtain pure red cell packs. A suspension of 5% hematocrit was prepared by mixing the red cells with PBS buffer. The suspension was used for the measurement of deformability. Collection and deformability measurements of erythrocytes were done at 22 °C.

The constant-current filtrometer system was used for measurement of erythrocyte deformability. Samples were prepared as 10 ml of erythrocyte suspension and PBS buffer. The flow rate was held constant at 1.5 ml/min with an infusion pump. The 28 mm nucleoporin polycabonate filter with a 5 µm pore diameter was used. The pressure changes during passage of erythrocytes through the filter were detected by the pressure transducer and the data was transferred to computer with the help of MP 30 data equation systems (Biopac Systems Inc, Commat, USA). Pressure changes are measured various times to calculate the necessary values via computer programs. A pressure calibration of the system was performed each time before measuring the samples. First the buffer (PT) and then the erythrocytes (PE) were passed through from the filtration system and the changes in pressure were measured. The relative refractory period (Rrel) was calculated by relating the pressure value of erythrocyte suspension to pressure value of buffer. Increase in Rrel was interpreted as a decrease in erythrocyte deformability (12,13).

Statistical analysis

Statistical Package for the Social Sciences (SPSS, Chicago, IL, USA) 17.0 program was used for statistical analysis. Variations in blood glucose level, erythrocyte deformability were assessed by using Kruskal-Wallis test. Bonferroni adjusted Mann-Whitney U test was used after significant Kruskal-Wallis to determine which group differs from the other. Results were expressed as mean± standard deviation (Mean ± SD). Statistical significance was set at a p value <0.05

Results

Blood glucose measurements were 81.7 ± 5.5, 345.1± 48.3, 355.7 ± 78.6, 328.5 ± 81.5, 352.8 ± 77.6 mg /dL for Group C, DC, DP, DM and DPM, respectively. Serum glucose was detected to be significantly lower in Group C, when compared to Groups DC, DP, DM and DPM (p<0.0001, respectively).

The deformability index was significantly increased in the diabetic rats (p<0.0001). However, it was similar in Group DC and DP (p=0.551), Group DC and DM (p=1.000), Group DC and DPM (p=0.176), (Fig 1).

Discussion

Alteration of ED in diabetes is shown in several studies (14-16). In our study we also demonstrated a significant decrease in ED in diabetic rats. Increased phospholipid concentration in the membrane, glycosylation of cytoskeletal proteins and changes in ionic balance are implied as well as lipid peroxidation and endoplasmic reticulum stress (2).

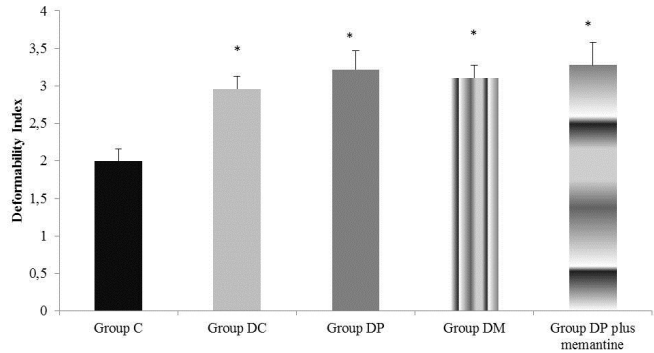

Figure 1: Erythrocyte deformability values of the groups. Each bar represents the mean ± sd. * $p<0.05$ compared to the Group C

Among them oxidative stress may be important since an antioxidant molecule; carnosine is shown to reverse the effect of diabetes on ED and improve red cell rheology (17).

The presence of functional NMDA Rec on erythroid precursors and mature erythrocytes is shown by Makhro and colleagues (11). In their study, they demonstrated a calcium influx in a subgroup of cells in response to NMDA, which in turn triggered changes in cell volume and nitric oxide (NO) synthesis. A similar study in humans yielded compatible results. Increase in intracellular calcium is shown to promote cleavage of cytoskeletal proteins and plasma membrane calcium pump thus changing the rheological properties of the cell (18).

Memantine is clinically used in Alzheimer's disease and is a promising agent in neurodegenerative diseases characterized by NMDARec overactivation. Memantine inhibits NMDA Rec by binding the channel only when it is open and is trapped in the channel to prevent any further binding of agonists (19).

Reinhart and colleagues used a Myrenne aggrometer to investigate the role of NMDA in red cell rheology. The investigators failed to show a change in biophysical properties of human erythrocytes via activation or inhibition of NMDA receptors by homocysteic acid and memantine respectively (20).

Our results are consistent with the findings in this study. Although memantine binds to NMDA receptors and at least a subgroup of red cells are shown to have these receptors, memantine does not seem to affect red cell rheology.

Propofol is a sedative hypnotic agent which activates γ -aminobutyric acid (GABA) receptors directly and inhibits the NMDA receptor and reduces calcium influx through slow calcium channels (21).

In our study, we observed that propofol does not affect ED in diabetic rat model. There are contradictory results regarding the effect of propofol on red cell rheology in literature. Propofol is shown to increase relative resistance of erythrocytes in rats (13) On the other hand, a study on diabetic rat model showed no effect of propofol on ED (22) Reinhart et al incubated blood from healthy volunteers with propofol at different concentrations and reported a dose-dependent echinocytic change in erythrocytes (23). A study on patients undergoing cardiac surgery detected an increase in postoperative blood viscosity with propofol when compared to fentanyl (24). However Kim et al failed to demonstrate a significant change in ED in blood containing propofol at different concentrations (25).

Conclusion

Erythrocyte deformability was damaged in rats having diabetes. This injury might lead to further problems in microcirculation. Application of propofol and memantine did not alter red cell deformability in diabetic rats. This lack of effect may partly be due to binding properties of these agents or specific properties of red cells which do or don't bear NMDA receptors.

This result may also be explained by the complex effect of diabetes on ED through variable mechanisms including oxidative stress, change in membrane lipids or cytoskeletal proteins which probably may not be changed simply by activation or inhibition of NMDA receptors

Acknowledgement

All authors state that there is no conflict of interest

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A phosphate enema-associated chemical colitis

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Abstract

Enemas are widely used in patients with poor colon cleansing in preparation for colonoscopy. Although they are regarded as having minimal side-effects, enemas can give rise to severe side-effects due to the chemical substances they sometimes contain. We report a case of ischemic colitis emerging in association with enema use during preparation for colonoscopy in a 45-year-old woman who was performed rectal resection due to ischemia-related stricture.

Key words: Chemical colitis, Rectal fibrosis, Phosphate Enema, Colonoscopy

Introduction

Colonoscopy is widely used for the diagnosis and treatment of colonic lesions. Adequate bowel cleansing is the basis of successful colonoscopy (1). Various preparations are used to preparation for colonoscopy. The most popular of these are polyethylene glycol (PEG) and sodium phosphate, which generally provide adequate cleansing (2). The use of enemas, the basic element in preparation for colonoscopy until the development of PEG, is today limited to individuals with poor colonoscopy preparation (3).

Oral use of drugs including sodium phosphate for colonoscopy preparation may lead to electrolyte anomalies and renal toxicity. Rectal use is reported to lead to complications such as hyperphosphatemia, hypokalemia and, rarely, rectal necrosis (2, 4, 5).

We report a case of chemical colitis in the rectum associated with enema during preparation for colonoscopy performed to investigate the etiology of abdominal pain.

Case

A 45-year-old woman was scheduled for colonoscopy**.** The patient had long-term abdominal pain, but no history of rectal bleeding. Preparation for colonoscopy was initiated with laxative containing 500 mg sennoside A + B calcium (XM Solüsyon ®, Yenişehir Pharmaceuticals, Turkey) the preceding day. However, since the patient failed to exhibit sufficient compliance with dietary restriction, enema was administered containing 28.5 g sodium dihydrogen phosphate and 10.5 g disodium hydrogen phosphate in 177 ml (BT enema 135 ml) into the rectum in hospital before colonoscopy. Defecation was occurred post-enema. In the Colonoscopy was revealed widespread petechial lesions and ischemia-like appearance in the mucosa, more intense in the distal part of the rectum (Figure 1). Access to the proximal colon was impossible due to severe pain and fragility in the mucosa. During the procedure, Blood pressure was 100/70 mmHg and heart rate 106/min. Following the procedure, hospitalization was advised, but the patient, who reported no pain, refused hospitalization, the patient was represented to our clinic 2 months later due to constipation. Anamnesis revealed rectal bleeding with defecation for 1 week after colonoscopy. The rectal ampulla was empty at digital rectal examination, and rectoscopy was performed without enema. Narrowing 4-5 mm in diameter associated with fibrosis was observed at the 7th cm in the rectal lumen (Figure 2). Surgery was recommended. Low anterior resection was performed at another center, and were reported submucosal fibrosis and mucosal erosion in pathologic examination

Discussion

Enema was represented the basic component of colonoscopy preparation until the development of PEG by Davis et al. in 1980 (3, 6). In 1992, Lever et al. suggested that additional use of enemas following colonoscopy preparation with PEG was not useful and increased patient discomfort (7).

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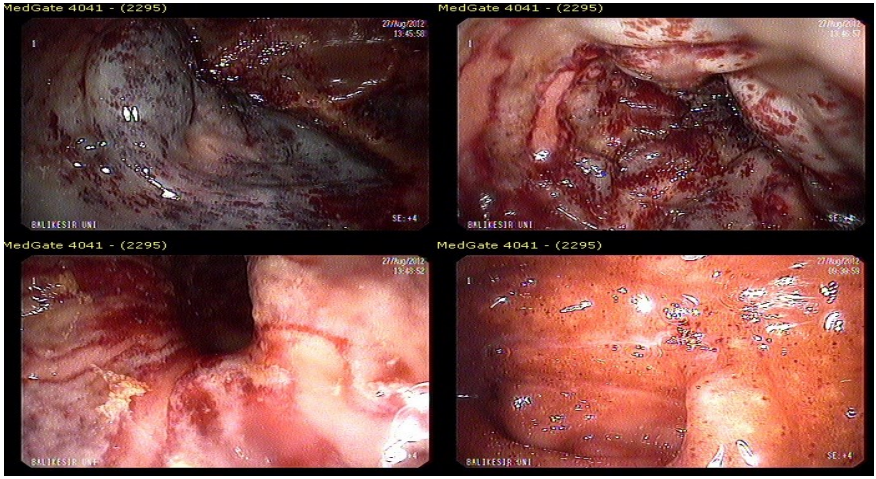

Figure 1: Widespread petechial lesions and ischemia-like appearance in the rectal mucosa

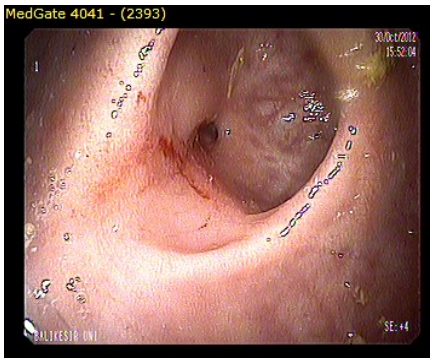

Figure 2: Narrowing due to fibrosis in the rectal lumen

On the basis of this anecdotal information, the American Society for Gastrointestinal Endoscopy (ASGE) recommended the use of enema in individuals with poor distal colon preparation (3).

Various enema preparates containing water, soap foam, mineral fats, hydrogen peroxide, bisacodyl or sodium phosphate are available (3). Although they have been used in the general population with minimal side-effects for years, enemas can sometimes cause severe side-effects (7). Life-threatening colitis developing in association with hydrogen peroxide have been reported (8). Side-effects such as hyperphosphatemia, hyponatremia, hypocalcemia, hypokalemia and metabolic acidosis have been reported in association with enemas containing sodium phosphate. These side-effects have particularly been reported in advanced age groups and in individuals with comorbid diseases such as kidney failure (9). Cases of rectal necrosis requiring abdominoperineal resection and permanent colostomy have been reported following phosphate enema use (5). Authors suggested that the necrosis is started by mechanic injury of the rectum by the tip of the enema tube (5). In our patient, Colitis was generalized and traumatic signs were not seen in colonoscopy

Following administration of enema in our case, widespread petechiae and a dark purple appearance resembling ischemia were observed in the rectal mucosa. This colonoscopic appearance resembled a case of colitis mimicking ischemic colitis emerging after administration of enema containing alcohol described by Randolph et al. (10). In our patient, enema containing sodium phosphate was used.

Complications such as stricture, perforation and fulminant colitis may develop in cases of chemical colitis due to enema.

Administration of high-dose intravenous steroid and antibiotic therapy has been described in order to prevent these complications (11). Unfortunately, no treatment was performed in the acute period in our case due to patient refusal. However, no septic complications developed. Stricture was developed in the long term, and surgical resection had to be performed.

Conclusion

In conclusion, enemas used in patients presenting to the emergency department with constipation and to prepare for colonoscopy may lead to such severe complications as chemical colitis and rectal necrosis. Patients scheduled for enema must be informed of potentially life-threatening complications, and the procedure needs to be used in an appropriate patient population in order to minimize enema-related complications.

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A case report of human infestation with pubic louse (Pthirus pubis) in Sarab city, Iran

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Abstract

Lice were collected from 47 years old male worker on his complaint for itching and red rashes on body. The lice thus collected were subjected to microscopic examinations and identified as Phthirus pubis, commonly known as the crab louse, an ecto-parasite which is only found on humans and requires human blood to survive. The infested parts of the body of worker was treated with 1% Permethrin cream, that was applied for 10 minutes and then rinse off with water. Second treatment was done on day and after 14 days no viable lice and nits were seen on the body of the victim

Key words: Human Louse, Phthirus pubis, Sarab city, Iran.

Introduction

The sucking lice (order Anoplura) are small, wingless and dorso-ventrally flattened insects. This order contains several families of which Pediculidae and Pthiridae parasitize human, so called human lice. There are two species of Pediculidae, head and body lice (Pediculus capitis and Pediculus humanus) and a species of Pthiridae, pubic louse (Pthirus pubis) that infect humans (1).

Lice infestations have been prevalent among humans for many centuries and it has been revealed that lice infestations are associated with lack of hygiene and poverty in human societies.*Phthirus pubis,* commonly known as the crab louse, is an ecto-parasite which is only found on humans and requires human blood to survive.

The crab louse does not fly and jump, only crawl slowly, so it usually needs close and prolonged contact to infest new hosts, most often through sexual contact, although it may occur via close nonsexual contact, including toilet seats, clothing, or bedding (1). Pediculosis pubis (PP) is infestation with pubic lice of the species *Phthirus pubis*.

There are no ratial differences in its incidence and the infestation is generally common. Direct contact is the primary source of transmission. In adults, PP most frequently occurs as a sexually-transmitted disease (STD), commonly associated with other STDs. However, transmission may occur from sheets and clothing. *Phthirus pubis* habituates regions that are rich in apocrine glands, so predilection sites are pubic area, axillae and eyelashes.

Scalp hair, beard, moustache, and in hirsute individuals short hairs of the thighs, trunk and perianal area may be involved. *Phthirus pubis* in eyelashes and periphery of the scalp is mainly found in children, probably as the result of contact with an infected parent (2). Pubic lice feed and reproduce on the human host cementing their nits to the hair shaft 1 cm from the skin surface and nits hatch in 8 to 10 days. The majority of patients complain of pruritus. Pruritus is moderate.

Typical clinical findings are blue to grey macules (sky-blue spots), *maculae ceruleae*, sized from several millimeters to several centimeters (2).

Excoriations are not commonly found. Secondary infection due to excoriations can lead to local lymphadenitis and fever. *Pthirus pubis* is a specific parasite of humans, and although its transfer to a dog has been recorded (3) it cannot survive off the host for more than 24 hours. The pubic louse is spread primarily through close physical or sexual contact, with about 95% of sexual contacts becoming infested (4).

The diagnosis is confirmed by microscopic examination of the plucked hair to identify the nits with vital nymphs and hatched empty cases. Lice are difficult but possible to see with close inspection or magnification. Additionally, dermoscopy allows to differentiate nits with vital nymphs from empty cases and to identify pubic lice (5). Infestations with pubic lice are more common in people of low socio-economic status (6) and are frequently associated with the presence of other sexually transmitted infections (7).

It has been stated than the population with the highest incidence of pubic lice is similar to that with a high incidence of gonorrhea and syphilis: single persons and those between 15 and 25 years of age (8).

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Case

A 47 year old male worker in sarab city of Iran, came to the Department of Parasitology, Islamic Azad University, Tabriz, Iran, suffering from constant itching on the both upper arms lasting for two weeks and claimed that due to close contact with a dog he was getting tick infestation. Physical examination of the patients revealed typical clinical findings-blue to grey macules on both arms with very small lice (Figure-1).

Figure 1. Photograph of Female pubic louse (Phthirus pubis).

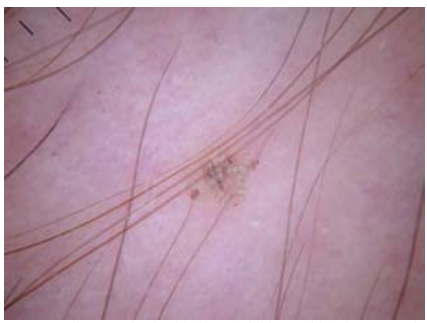

Figure 2. Photograph of pubic louse (Phthirus pubis) nit cemented with hair.

Further investigation revealed that there was severe irritation or itching on the pubic area. During investigation patient admitted that he had used his friend's bed and it could be the source of infestation. Symptomatically patient also indicated pruritus, itching, anorexia, lethargy, weakness and sexual depression.

The lice and nits were removed manually with a pair of tweezers and were placed on a glass slide; a drop of glycerin was used as a mounting media and covered with a glass cover slip. Results of microscopic examination revealed the presence of *Phthirus pubis* (Pubic lice) and their nits cementing with the hairs (Figure-2). Male and female *Phthirus pubis* was identified on their morphological Characters (Fig 1 and 2). The infested parts of the body of worker was treated with 1% Permethrin cream, that was applied for 10 minutes and then rinse off with water. Second treatment was done on day 10 and after 14 days no viable lice and eggs were seen on the body of the victim

Discussion

Normally crab louse infestation is limited to pubic area, but other hair- bearing sites such as thighs, axillae, mustache, beard, eyelashes, eyebrows and trunk can be involved (9,10). The first case was reported in 1892 and most reported cases were found in children. The youngest reported patient was a 6-week- old male infant (11, 12).

Goldman found a female to male ratio of 2:1 (13, 14, 15). On the bases of present case, it may be concluded that 02 application of 1% Permethrin cream, for 10 minutes on day 1 and 10 gives significant result, as no viable lice and eggs were seen on the body of the victim.

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Unilateral Ureterocele Presenting With Multiple Stones In An Old Lady: Endoscopic Incision and Stone Extraction

Mehmet Bilgehan Yuksel[1*]

Abstract

In this video included case presentation, we aimed to present the application of endoscopic incision of ureterocele and simultaneous stone extraction in an old female with a large ureretocele containing multiple urinary stones and to show the affectivity and applicability of endoscopic treatment of ureterocele in elderly patients.

Key words: Ureterocele, Duplex Collecting System, Endoscopic Incision, Adult, Stone Extraction

Introduction

Ureterocele is commonly unilateral and intravesical disorder in adults (1). The overall incidence of stones in ureterocele varies from %4 to %39. The dysfunction of ureteral motility and urinary stasis provoke the formation of subsequent urinary stone in ureterocele. Thus, ureterocele is commonly concomitant with urinary stone disease (2, 3).

Various treatment alternatives are present for the treatment of ureterocele. Although controversies are present regarding the effectiveness of endoscopic incision, the studies have shown that the risk of iatrogenic vesicoureteral reflux is commonly low if a low transverse incision was performed (4, 5).

Furthermore, endoscopic ureterocele incision and stone extraction is an effective and minimally invasive treatment alternative for adult ureterocele containing concomitant urinary stone with minimal risk of iatrogenic vesicoureteral reflux and other complications related to the surgery (6).

Case

In this video, we aimed to present our step-by-step technique of endoscopic incision of ureterocele and stone extraction in a 66 years old female patient with an extremely big ureterocele containing multiple urinary stones.

The patient was with the complaints of flank pain and disuria. Preoperative intravenous pyelography (IVP) revealed a right complete duplicated renal collecting system, severe dilatation and tortuosity of upper pole ureter, an extremely big ureterocele at the end of the upper pole ureter and multiple urinary stones inside the ureter and ureterocele. She has the history of previous appendectomy and the comorbidities of hypertension and coronary artery disease. The patient was diagnosed ureterocele with multiple urinary stones and an endoscopic treatment was planned.

The patient was prepared under spinal anaesthesia and positioned in lithotomy position. Under direct visualisation of cystoscopic view, the ureterocele and other ureteral orifice of the duplicated urinary system have been detected.

A ureteral catheter was placed into the other ureter for safety. Subsequently, a transverse endoscopic incision was performed by using a 26 F standard resectoscope with an electrical loop of transurethral incision of prostate (TUIP) at the inferior border, and an artificial secondary ureteral orifice has been created.

Through this new orifice, the resectoscope was inserted into the ureter, and multiple ureteral stones were seen inside the ureterocele cavity and dilated ureter. These stones were extracted by using stone forceps and directly irrigation and decompression of the ureteral lumen. No stone fragmentation was required in this operation. After the elimination of all of the stones, a 4.8 F DJ stent was inserted into the ureter and the procedure has been completed without any complications (http://medscidiscovery.com/?msd=Videos).

At the postoperative follow up period, no complication was occurred and all of the complaints were improved. Postoperative 6th month IVP showed that severe hydronephrosis and ureteral tortuosity at preoperative IVP was significantly improved.

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Conclusion

This video included case presentation revealed that ureterocele incision should be safely used for the treatment of ureterocele in adults. In addition, additional interventions for concomitant disorders, such as urinary stone, can be simultaneously applied without any requirements of other surgical interventions.

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A case of intracranial migration and rapid spontaneous resolution of traumatic acute subdural hematoma

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Abstract

Traumatic acute subdural hematoma (ASDH) is one of the most destructive forms of traumatic brain injury (TBI), involving estimated mortality rates of 40-60%. Traumatic ASDH is a frequently seen life-threatening condition requiring emergency intervention. Spontaneous resolution and migration of ASDH are both rare entities, the causes of which are still not fully understood. The few existing cases in the literature of both rapid spontaneous resolution of SDH and of subdural migration are generally in the form of case reports. Publications concerning migration of SDH mainly involve migration to the lumbar region. We encountered no previous reports of intracranial migration of ASDH accompanied by rapid spontaneous resolution. This report describes a case of intracranial migration and spontaneous resolution within 24 h in a 61-year-old male patient with traumatic acute subdural hematoma (ASDH), together with a discussion of the relevant mechanisms.

Key words: intracranial subdural hematoma, emergency medicine, traumatic brain injury

Introduction

Traumatic acute subdural hematoma (ASDH) is one of the most destructive forms of traumatic brain injury (TBI), involving estimated mortality rates of 40-60% (1). Hematoma developing post-traumatically generally results in tearing of the bridging veins between the medial facet of the cerebral hemisphere, the falx cerebri, the superior sagittal sinus and the parieto-occipital cortex (2). Monitoring and treatment of ASDH is based on serial computerized tomography (CT) of the brain, depending on the patient's neurological status and thickness of hematoma. Generally, surgical intervention is recommended in subdural hematomas (SDHs) greater than 10 mm, while surgery is not effective in hematomas smaller than 3 mm. Debate still continues regarding whether surgical intervention or a conservative approach is preferable in patients with a thickness of 5-10 mm and a Glasgow Coma Scale (GCS) score of 9-11 (3).

Rapid resolution of intracranial ASDH was first reported in 1986 (4,5). The time to resolution of ASDH in the literature varies between the first few hours after trauma to a few days (3,6).

Migration of acute hematoma in the subdural area is not a clinical rarity. There are few reports of migration of SDH in the literature, however, and those there are generally involve migration to the spinal canal (7-11). The purpose of this report was to describe a case of intracranial migration in post-traumatic acute subdural hematoma, followed by spontaneous resolution

Case

A 61-year-old male was brought to the emergency department after a fall of approximately 5 meters. Vital findings on arrival were TA: 120/70 mmhg, pulse: 88/min, respiration rate: 20/min and oxygen saturation: 94. GCS score was 15. At physical examination, ecchymosis was determined in the right maxillary and frontotemporal region, laceration and crepitation in the right wrist, and edema, deformity and crepitation in the central third of the right femoral region. Sensitivity was determined in thoracic vertebrae 9-12.

Imaging techniques revealed open partial fracture at the distal end of the right radius, shaft fracture of the right femur, fissure-type fracture in the T9, 11 and 12 corpus vertebrae not extending to the spinal canal and plastering SDH in the right frontotemporal region (Figure 1).

Laboratory findings were WBC: 12.58, HGB: 12.3, PLT: 161,000 and INR: 1.22. The patient was admitted to the intensive care unit. Control tomography of the brain performed 6 hours later revealed migration of the SDH in the right frontotemporal region to the right parieto-occipital region (Figure 2). Tomography of the brain performed after 24 h revealed no finding of intracranial haemorrhage. The patient had no neurological deficit. Cranial and cervical magnetic resonance imaging (MRI) was performed in order to determine complete resolution and presence or absence of migration to the spinal canal.

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Cranial MRI revealed no findings of haemorrhage and cervical MRI revealed no findings of migration (Figure 3). The patient had no neurological deficit due to the extremity fractures and was transferred to the orthopaedic clinic.

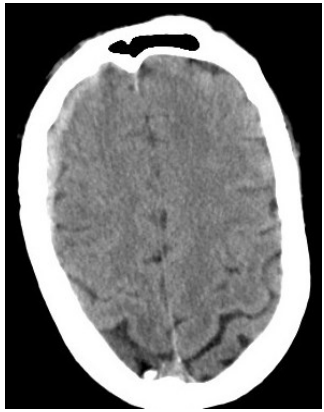

Figure 1. Subdural hemorrhage in the right frontotemporal region

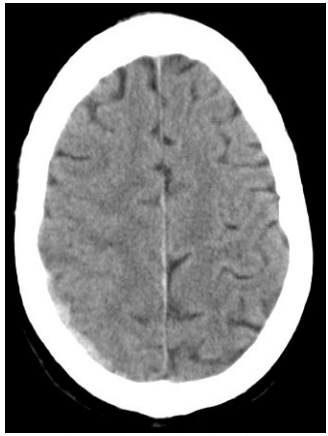

Figure 2. Subdural hemorrhage in the right parieto-occipital region

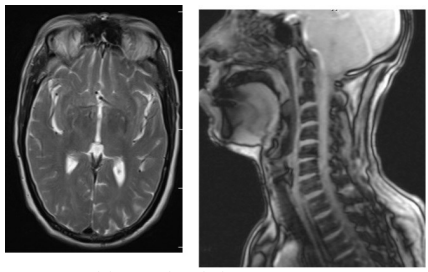

Figure 3. Cranial MRI and cervical MRI

Discussion

Traumatic ASDH is a neurological emergency constituting 10-20% of all major head traumas (2). The few existing cases in the literature of both rapid spontaneous resolution of SDH and of subdural migration are generally in the form of case reports. Publications concerning migration of SDH mainly involve migration to the lumbar region. A disposition to hemorrhage, blunt trauma, anticoagulant or anti-aggregant therapy and invasive procedures such as lumbar puncture and epidural or spinal anesthesia all play a role in the etiology of migration to the spinal canal. It may also, albeit rarely, occur spontaneously (10).

Lumbar SDH was first described in 1948 by Schiller et al., in a 16-month-old male patient (12). Migration of intracranial SDH to the spinal canal was first described by Bortolotti et al. They reported a case of traumatic subdural bleeding in a 23-year-old woman with no spinal trauma findings (7).

Most cases of migrating SDH in the literature involve spontaneous SDH, although traumatic cases have also been reported. Yang et al. reported a case of spontaneous subdural and spinal hematoma as a result of lower back ache and paraparesis developing after 1 week in a 35-year-old woman presenting with symptoms of headache and dizziness. No vascular abnormality (arteriovenous fistula or vascular malformation) was determined at cerebral or spinal angiography in that case (8).

Gilad et al. described a case of migration to the spinal canal of SDH resulting from spontaneous anterior communicating artery aneurysm rupture without trauma in a 47-year-old man with a history of hypertension, with headache and lower back pain for the previous 3 days and with no subarachnoid hemorrhage (9).

Moscovici et al. reported migration to the spinal canal of SDH resulting from minor head trauma in an 88-year-old male patient (10). Similarly, Li et al. reported migration to the spinal canal of cranial SDH developing following trauma in a 26-year-old man (11).

Kapsalaki et al. published a series of four cases of spontaneous resolution and redistribution of ASDH. These cases of traumatic SDH consisted of 2 male and 2 female patients requiring no surgical intervention. Duration of spontaneous resolution varied between 6.5 h and 7 days. Coagulation disorder was determined in only one case. That case (INR>2.8) had GCS of 8 and SDH thickness of 18 mm. In the other 3 cases, GCS was 7-8 and SDH thickness 8-9 mm. (3). Yadav et al. reported spontaneous resolution after 72 h in a 55-year-old male patient with GCS 6 with traumatic SDH and subarachnoid hemorrhage (SAH) (6).

The causes of spontaneous resolution of SDH are not fully established. There are various theories on the subject. According to one, rapid resolution of ASDH results from redistribution of blood, and it has therefore been suggested that redistributed blood that

cannot be visualized at CT can be seen at MRI (5). According to another hypothesis, a rise in intracranial pressure following cerebral edema may lead to obliteration of ASDH (13). Another theory regarding hematoma resolution is washing and drainage of the hematoma by cerebrospinal fluid (CSF) thanks to tearing of the arachnoid membrane during trauma (14,15).

Kundra et al. described spontaneous resolution and extracranial redistribution of ASDH and stated that ASDH gave rise to scalp hematoma by passing through a dural tear or calvarial fracture with direct pressure on the soft tissue, thus exhibiting redistribution (16). Another similar study suggested that linear skull fractures assisted distribution of ASDG into the extracranial area, as a result of which SDH progresses toward scalp hematoma through the bone fracture and meningeal tear pathway (17). There was no bone fracture in our case.

Another study showed that the presence of another SDH on the opposite side of the same hemisphere caused one hematoma to shrink while the other expanded (18). Cohen et al. suggested that cerebral atrophy developing in association with HIV facilitated resolution of ASDH (19).

Wu et al. suggested that a hematoma volume of less than 30 ml, and location near the sylvan fissure and in the frontotemporal or temporoparietal region affected spontaneous resolution of ASDH (20). The resolution mechanism in our case is compatible with the theory proposed by Wu et al. because the ASDH in our case had a small volume and was located in the frontotemporal area.

Conclusion

Our scan of the literature revealed no previous reports of concomitant intracranial migration of ASDH and rapid intracranial resolution. We think that this interesting case will make a useful contribution to the literature.

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