
The Islamic Medical Association of North America (IMANA) and The International Institute of Islamic Medicine (IIIM)



Innovations in Medicine, Islamic Medical History, and Ethics

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Abstracts

1 Slowing the Aging Process

Steve S. Bedi, MD
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Allah has given us a beautiful body (*imāna* [trust]). The living unit of the body is the cell. Disease starts at the cellular level. Chronic illness is caused by degeneration at the cellular level.

To regenerate or slow the process of degeneration, one needs to reduce stress through *ṣalāh* (ritual prayer), exercise, proper diet, and nutritional supplements.

It has been proven and published that people who pray regularly have fewer chronic illnesses. Through *ṣalāh*, we can increase love, peace, mercy, and patience. If people combine prayer with exercise and proper nutrition, the results will improve the immune system and promote healing and regeneration. Studies show that physical activity reduces stress as well as keeps muscles strong to carry the body weight and help reduce body weight. Many chronic diseases are aggravated by increased body weight. Diet and nutritional supplements also increase cellular health and reduce entropy (Second Law of Thermodynamics).

2 Ethics of Animal and Human Experimentation: An Islamic Perspective

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Animal and human experimentation is crucial to the understanding of physiology and pharmacokinetics in order to advance better treatment modalities for the future of humanity.

In this paper, the Islamic ethics of animal and human experimentation are discussed. This will include principles of Islamic medical ethics, composition and duties of ethics committees, responsibility of the investigator and the sponsoring institution, informed consent for human subjects, animal rights

and compassion, and guidelines for ethics advisory boards.

3 Does Islam Permit Stem Cell Research? Ethical Considerations

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Objectives:

1. To describe the nature and sources of stem cells now available.
2. To discuss briefly their potential uses both in research and therapy.
3. To discuss the ethical considerations, specifically from an Islamic perspective.

Stem cells (SCs) are pluripotent cells that retain the ability to develop into all cell types. This characteristic made them appealing for use in research with view of potential therapeutic use, especially in "regenerative medicine." Available sources of stem cells now are:

I. Embryonic Stem Cells (ESCs)

The main source of stem cells is the inner cell mass of developing embryos, the ESC. Human embryonic stem cells (hESCs) can be obtained from supernumerary fresh or cryopreserved embryos produced during the course of reproductive in vitro fertilization (IVF) or from IVF cycles specifically performed for research. While at present there are only few human ESCs that are available for research, there are several murine ESCs that are produced and have been extensively used in the following research:

- A. To differentiate into different types of cells and implanted in vivo in experimental animals e.g. in cardiac and neuronal tissue to produce a therapeutic result. It is hoped that this research can be applied to the treatment of human disease. It appears to be especially promising in neurodegenerative diseases and spinal cord injury;
- B. To develop novel drugs that can be tested in

- vitro for safety, prediction of potential toxicity, and studying embryotoxic properties; and
- C. To correct genetic defects.

II. Adult Stem Cells (ASCs)

Stem cells present in adult tissues, the best known of which are the hematopoietic cells of the bone marrow. These have been used clinically with good results in the treatment of leukemias.

III. Cord Blood

Cord blood is another source of "adult" hematopoietic stem cells. Cord blood is collected at the time of delivery, frozen and stored at a cord blood bank, either private or public, and likely can be used for several years.

IV. Therapeutic Cloning

Therapeutic cloning utilizes stem cell nuclear transfer (SCNT) techniques to produce pluripotent SCs with the genome of the nucleus of origin. These cells can be induced to differentiate into replacement cells for transplantation into the individual from whom the original cell was obtained, thus eliminating the requirement of immune suppression.

While stem cell research has great therapeutic potential, there are still potential risks, i.e. genetic mutations that occur with each cell division, epigenetic modifications, tumorigenesis, immunogenicity, and graft rejection. Stem cell research should be encouraged and continued.

The use of ASCs, including cord blood, should not raise concerns from the ethical point of view other than the general ethical principles of privacy, consent, and handling the cells with dignity.

The use of hESCs, whether derived through reproductive IVF or SCNT, raises significant ethical concerns. These revolve around the question of when life begins and the moral status of the human embryo. I will discuss the various viewpoints regarding these issues from both the ethical and religious perspectives and will propose a middle ground view that is probably acceptable Islamically. I believe that stem cell research, including the use of hESCs, is probably Islamically permissible except that it is prohibited to create embryos only for the specific purpose of using them in research. Therapeutic cloning, when the intent is to create tissue/organ from an individual who needs it, if it is feasible and the result is expected to be good, is also Islamically acceptable.

4

Spirituality, Medicine and Religion

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What is the role of a physician beyond offering the diagnosis and therapeutic options? Does he need to understand the spiritual needs of the patient? How does his own spirituality affect the way he treats his patients? Should he incorporate spirituality and prayers as an adjunct to conventional treatment modalities, and does it make any difference in the outcome? These questions and their answers are discussed in this presentation in light of current research and Islamic perspective.

5

The Traditional and the New Neurotransmitters and Neuromodulators

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Aside from the traditional neurotransmitters acetylcholine, epinephrine, norepinephrine, dopamine, gamma-aminobutyric acid (GABA), and glycine, a number of new neurotransmitters and neuromodulators have been identified in the central and peripheral nervous system. These include, but are not limited to, vasoactive intestinal polypeptide (VIP), atrial natriuretic peptide (ANP), brain natriuretic peptide (BNP), cholecystokinin (CCK), calcitonin gene-related peptide (CGRP), gastrin-releasing peptide (GRP), neuropeptide Y, enkephalins, endorphins, dynorphins, somatostatin, substance P, histamine, serotonin, galanin, glutamate, aspartate, and nitric oxide (NO).

Using electrophysiologic, immunocytochemistry, and intracellular dye injection techniques, the location and function of some of these new neurotransmitters and neuromodulators will be illustrated.

The cytologic and electrophysiologic properties of some of the autonomic ganglia, such as the superior cervical ganglion, pelvic ganglion, and colon ganglion will be presented, and their response to some of the new neurotransmitters will be demonstrated.

6

Three Stooges of the Gastrointestinal Tract: Gas, Belching, and Flatus

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Most of the patients seen in our gastrointestinal (GI) clinic have problems with one or more of the following: gas, belching, and excessive flatus, with or without abdominal pain. These three symptoms represent a spectrum of a broader disorder, irritable bowel syndrome. Patients with these symptoms are hypersensitive to minor quantities of physiological gases such as oxygen, hydrogen, nitrogen, methane, and others. These patients also have different symptoms including migraine headaches, chronic fatigue syndrome, noncardiac chest pain, and generalized anxiety.

Even though they have variety of symptoms, treatment is very simple and effective. Reassurance, simple dietary instructions, regular follow up, and symptomatic treatment of their symptoms on a regular basis are needed to improve their overall well-being.

I will discuss the pathophysiology, symptomatology, diagnostic work up, and effective treatment of these patients. Data also will be presented to delineate the red flags that separate this complex set of symptoms from other serious gastrointestinal disorders.

7

The Ethics of Preimplantation Genetic Diagnosis: The Islamic Viewpoint

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Objectives:

1. To describe the procedure of preimplanted genetic diagnosis and its uses.
2. To discuss the ethical concerns, especially from an Islamic perspective.

Preimplantation genetic diagnosis (PGD) is a procedure whereby a cell (blastomere) is obtained from a blastocyst resulting from in vitro fertilization (IVF) and subjected to genetic testing such as FISH, DNA, etc. PGD is to be used when a couple has a high risk (25-50%) of transmitting a genetic disease (including x-linked hereditary disease) to their offspring or to improve the chances of success in IVF for women of advanced maternal age and those with repeated pregnancy losses and repeated IVF failures. IVF is performed, and the multiple developing blastocysts are tested to determine which ones are negative for the specific disease and/or are karyotypically normal. These can be implanted in the uterus, while the affected ones are "discarded".

PGD is attractive because it eliminates the need for invasive antenatal diagnostic procedures i.e. chorionic villus sampling (CVS) or amniocentesis and the need for termination of the pregnancy if testing reveals that the fetus is affected. However, one has to consider the cost and the small (1-2%) possibility of misdiagnosis.

Ethical concerns are:

1. What is the moral status of the embryo? When does human life begin?
2. Is it morally/ethically acceptable to sort out "human" embryos and to discard "defective" ones?
3. Is it acceptable to use PGD to create a transplant donor?
4. Potential for abuse:
 - a. Eugenic reasons,
 - b. Gender selection for nonmedical reasons (other than the risk for x-linked diseases),
 - c. Socioeconomic concerns: cost effectiveness and equitable access to PGD and the negative impact on the status of handicapped individuals.

Most Muslim scholars agree that the embryo prior to implantation is not yet a person. Thus PGD will be permissible to avoid or minimize the risk of severe debilitating disease in the offspring. However, it must be done with strict guidelines that prevent abuse, and PGD should not be used for gender selection for nonmedical reasons.

8

The Impact of Nutrition Therapy on the Natural History of Type 2 Diabetes Mellitus

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Introduction

The prevalence and incidence of type 2 diabetes is increasing around the world. This trend is attributed to the combination of advancing age of the population and increased risk factors, such as obesity and lack of physical activity.

Pathophysiology

The metabolic defect triad of type 2 diabetes is insulin resistance, impaired insulin secretion, and increased hepatic glucose production.

Etiology

Genetic factors play an important role in most patients with type 2 diabetes combined with acquired factors such as central (visceral) obesity, sedentary lifestyle, and high fat diet. The aging process contributes to the expression of diabetes in genetically susceptible individuals.

Natural history is the reflection of the interrelationships between the triad of metabolic defects. Environmental factors impact the natural history of diabetes, affecting its progression at all points, therefore manipulating these factors helps in changing the natural history of the disease process.

Treatment

The treatment of type 2 diabetes is based on both pharmacologic and nonpharmacologic measures. Nutrition therapy is one of the most fundamental nonpharmacologic components of treatment plan for all patients with type 2 diabetes. Nutrition therapy issues in type 2 diabetes are complex, and the nutritionist plays a pivotal role in implementing these issues. These functions are summarized as follows:

1. Initial assessment of nutritional status such as diet history, lifestyle, and eating habits
2. Patient education regarding the basic principles of diet therapy for diabetes, meal planning, and problem-solving techniques for changing eating behaviors
3. Developing an individualized meal plan by emphasizing one or two priorities and minimizing changes

from the patient's usual diet.

4. Assessment of the meal plan to determine effectiveness in terms of glucose, lipid control and weight loss, and making changes based on weight loss, activity level and changes in medication

5. Ongoing patient education and support to help patients learn to adjust their meal plans for various situations.

Conclusions

Meal plans and diet modifications should be individualized to meet a patient's unique needs and lifestyle. Combined with exercise, diet could be the sole therapeutic intervention. Furthermore, the pharmacologic treatment is often less successful if it is not combined with some type of dietary and exercise regime. It has been found that early dietary intervention in type 2 diabetes certainly slows the progression of diabetes and reduces the incidence of microvascular disease, hence changing the natural history of the disease process.

9

Metabolic Syndrome X

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Introduction

Metabolic syndrome X (MSX) is the fastest growing disease entity in the world. The concept of "metabolic syndrome" has developed over the past 70 years, starting with the British physician Hinselwood, who introduced the term "insulin sensitivity" in 1938 and was followed by the Italian researchers in the 1960s and the German researchers in the 1970s, who described a clustering of cardiovascular risk factors. The National Cholesterol Education Program (NCEP) established the final definition.

Definition

The five diagnostic criteria of MSX defined by NCEP Adult Treatment Panel III are abdominal girth of >40" in men and >35" in women, fasting triglyceride level of >150 mg/dl, fasting HDL-C < 40 mg/dl in men and < 50 mg/dl in women, fasting blood glucose \geq 110mg/dl, and blood pressure \geq 130/85 mmHg.

Prevalance

Metabolic syndrome X is highly prevalent in the United States, both among adults and children. Forty-seven million adults in the United States have this syndrome, including 50% of adults over the age of 60. Among children, 4.2% between 12-19 years suffer from this syndrome. The predisposing factors include poor diet, sedentary lifestyle, and genetic predisposition.

Risk Factors

MSX is a precursor to the development of type 2 diabetes mellitus and therefore helps in identifying individuals who are likely to develop diabetes if no intervention is begun at an early stage. The diagnosis of metabolic syndrome can help determine whether patients are at intermediate risk for the development of ischemic heart disease.

Treatment

The emphasis of effective treatment and prevention is on lifestyle intervention, including healthy diet, physical activity, and pharmacologic agents to target specific risk factors. Weight loss remains the pivotal approach that improves all aspects of MSX and is a primary intervention target. Pharmacotherapy is aimed at treating hypertension with various agents, primarily lipid-lowering medications such as statins, niacin, and fibric acid. Metformin and thiozolidinediones are used to treat glucose intolerance. Certain agents — such as sibutamine and orlistat — which the U.S Food and Drug Administration (FDA) approved, can also be used for a limited time to help in weight reduction.

Prevention

Effective weight management helps prevent the development of MSX. Lifestyle change strategies, including setting reasonable goals, raising awareness, confronting barriers to change, managing stress, cognitive restructuring, preventing relapse and providing support, are the key to long-term success. The clinical nutritionist plays a very important role in implementing all these aspects to prevent the development of MSX.

10

Museum of Islamic Medicine: Turning the Pages of History

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The history of Islamic medicine is rich with innovations, discovery, and contributions to human civilization. This museum will be the first of its kind in the world to exhibit the rich heritage that Islamic civilization brought to the science and art of medicine and surgery.

A practical approach to the development of this museum will be discussed.

At the heart of this museum there will be an exhibit centerpiece, entitled “Turning the Pages of Islamic Medical History ...”.

This will make the museum a unique attraction for Muslims and non-Muslims interested in the history of Islamic medicine.

11

Enhancement Technology and the Person: An Islamic Perspective

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Physically and intellectually, man is not the same as he was a million years ago. The resultling “improvements” in humans have come from within over a period of time and not as a result of any outside biotechnical intervention. So the question is what is the need now? The fine line between what can be done technically and what should be done morally is the reason for biomedical ethics. What is the nature of man and what is his relationship with his Creator and his environment? Whose interest (man, God, and environment) are we the scientists and physicians to guard and advance? What is the right of the unborn, and who protects these rights? While seeking medical treatment for infertility and reconstructive surgery for a malformation or genetic manipulation for a genetic disease may be appropriate and recommended, is it appropriate to create a super healthy, super human with genetic manipulation? If so, are we

embarking on a path of ethnic cleansing of humans of lesser ability, and is it appropriate to discriminate against them? In this presentation, such concerns and questions are discussed from an Islamic perspective.

12 Advances in the Management of Noninsulin Dependent Diabetes Mellitus

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Over the last 10 years, significant advances have taken place in understanding the pathophysiology, diagnosis, prognosis, and treatment modalities for noninsulin dependent diabetes mellitus (NIDDM). Newer agents, including new forms of insulin, new combinations of oral agents, and new tools to monitor treatment results have been offered to patients and their physicians.

In this presentation the rationale and the results of using newer agents are discussed. In particular, the place of Exenatide (Byetta), Pramlintide (Symelin), inhaled insulin (Exubera), and DPP-4 inhibitors are discussed. This will help practitioners take better care of their diabetic patients and hopefully reduce the degree of serious chronic diabetic complications.

13 New Frontiers in Repair of Abdominal Aortic Aneurysm: Open vs. Endograft Repair

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The abdominal aortic aneurysm (AAA) has been a challenge to vascular surgeons ever since the first aneurysm repair was done in the 1950s.

Conventional repair with excision of the aneurysm and replacement with a Dacron graft has stood the test of time for the last six decades with continued improvement in morbidity and mortality over time.

This time-tested method now has been challenged by a much less invasive technique, endovascular repair by endograft. This approach has revolutionized the repair of AAAs, and this form of repair has now been extended to even repair thoracic aortic aneurysms. We will examine the risks and benefits of this method and compare and contrast it with conventional open repair.

14 Innovative Genes for Innovative Therapies

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Eric Kandel's proposed discipline, psychosocial genomics, "How the subjective experiences of human consciousness, our perceptions of free will, behavior and social dynamics can modulate gene expression, and vice versa, ..." for application in psychotherapy, is examined as it does not explain the origin and function of human consciousness and subjective experience. In our recent ontogenomic investigation we ascribe conscious experience, leading to behavior and free will, to a novel society of noncoding genes, termed ontic-genes, which are defined to be endowed with an irreducible epistemic faculty to form concepts, termed noumenal concepts, as a basis of behavior and free will. From an evidence of ontic-genes as an origin of conscious experience, having been corroborated by the discovery of a novel RNA gene (HAR1F), which is responsible for the development of cerebral cortex, as well as from our clinical evidence of the role of noumenal concepts on cognitive development and behavior, we affirm that gene expression is modulated by conscious experience and behavior through the epistemic faculty of ontic-genes.

15 Use of Alternative/Complementary Medicines in Gastrointestinal Disorders

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Over the last few years of my gastroenterology practice, I have been aware of many alternative/complementary medications that many of my patients have been taking along with traditional medications I have given them for their gastrointestinal problems. During our initial history taking, my physician assistant asks them in detail the names of the alternative medications they are on, how long they have been taking them, and for what reason. Sometime they are on numerous alternative medications, which have caused adverse effects. These medications have been extensively used for colon cleaning, diverticulosis, constipation, diarrhea, peptic ulcer disease, hepatitis, liver cirrhosis, liver tumors, and others. Though I myself have not prescribed these medications, whenever we know that a patient is on alternative medications, my physician assistant and I have tried to find out the indications, pharmacology, side effects, cost and interactions with other medications. I will present my experience in our office about the use of these alternative/complementary medications.

Acknowledgement: I thank Ms. Jill Sheular, my physician assistant, who collected all the data.

16 Medical Relief in World Disasters

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During the last two years, Earth has faced natural disasters of great magnitude. A major earthquake in the Indian Ocean triggered a series of tsunamis. Waves of ocean water swept away tens of thousands of homes and a quarter million people in Indonesia, Thailand, India, and Sri Lanka. Katrina hit the southern coast of the United States, taking many lives, causing immense property damage. The tragic earthquake in Kashmir and Pakistan caused about a 100,000 deaths and a larger number of devastating injuries. The medical profession has had to provide relief

efforts all over the world. Due to improved communication, an international effort was mobilized on many fronts to handle these challenges. Many lessons have been learned, and new definitions of medical volunteerism have emerged. The Islamic Medical Association of North America (IMANA) was actively involved by sending medical teams and supplies and raising funds to help the affected. Particularly, in coordination with local organizations, hospitals, and other medical facilities, IMANA emerged as a significant NGO in helping Pakistan and Kashmir.

17 Role of Capsule Endoscopy in Gastrointestinal Disease

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Capsule endoscopy is becoming instrumental in investigating gastrointestinal disease. Before it was available, gastrointestinal tract diseases were left undiagnosed, or a diagnosis was assumed on the basis of clinical judgment.

To perform capsule endoscopy, a patient, on an empty stomach, swallows a capsule containing a battery, light source, camera, and transmitter. A receiver, which captures the photographs, is fastened to the patient's waist. After the patient passes the capsule, the receiver is taken off. Video pictures are viewed on a monitor with the help of software developed by Given Company. Step-by-step pictures of the esophagus, stomach, and small bowel are displayed on the monitor and reviewed by the gastroenterologist and an assistant. It takes about 45 minutes to 1 hour to review and interpret the video pictures. A report then is given to the referring physician.

We have been performing capsule endoscopy in the office for the last three years and have found it useful in diagnosing chronic anemia along with negative colonoscopy, gastroscopy, small bowel series, and other tests. Most of the time, we find multiple arteriovenous malformations (AVMs) are the cause of chronic anemia and stools with occult blood. It has also helped us to find many cases of small bowel polyps, tumors, celiac disease, and Crohn's disease. At this time, we are also using it to screen patients for suspected Barrett's esophagus.

My presentation will highlight small bowel problems we diagnose and manage with this new tool.