



KISH P & I LOSS PREVENTION CIRCULAR KPI-LP-177-2015
(Dealing with diabetic persons prior joining)

This circular is divided in 3 section as below:

- 1- Section 1 : introduction
- 2- Section 2 : case study
- 3- Section 3 : loss prevention and lesson to learn

Section 1: Introduction

This article depicts a brief review of diabetes mellitus (DM) for administrative and management department, in order to provide the crucial information regarding diabetes mellitus (DM), as one of the most common and worldwide metabolic disease.

In addition we tried not only to increase awareness of the relevant authorities in the field of health and human resources, but also to make them more familiar with intricate aspect of this disease.

Our intention is that, in the scope of this information, and the review of the present regulations and guidelines, rate of executive issues and financial expenditures would be declined.

We tried to write this paper, simple and in nonprofessional language, but the use of some medical terms was Inevitable.

We hope this first step, in spite of its deficit, would provide a basis for health and safety of shipping personnel.

We also expect, that the financial resources would be spent in a more cost benefit way in the future.

Section 2: Case study

Review an experience:

Recently, one of our crew members while sailing about Suez Canal, suddenly lost his consciousness.

Fortunately because of the immediate care and concern of the health staff at NITC, he was saved.

The reason of this accident was unknown for all staff and obviously for the patient himself.

With a great effort and expenditure of large amount of money the real cause was revealed.

The crew was suffered from DM and his first presentation was coma and high level of blood glucose.

Analysis of this accident, revealed shortage and inefficiency of current instructions for medical examination of the crew members.

Presence of alarming lab results and lack of a clear-cut instruction, and some sort of optimism, underlies a condition, that someone, who had almost certainly, suffered from DM, went to coma and struggled with death at sea site.

This article tries to outline a few dimension of DM, and also provide a brief guidance for its screening and diagnosis.

Main topic:

Diabetes mellitus (DM) is one of the most common metabolic disease. According to last study at 2011 the prevalence of this disease is about 11/34 percent (age group above 20 years old) in our country.

According to the study mentioned above, the incidence of potential diabetes is about 15 percent, that imply 1 in 6 at above 20.

Diabetes is classified in 3 classes:

Class 1DM: that include about 5 to 10 percent of all diabetic case, this type usually appear at childhood.

Class 2DM: this type is the most common type of the disease that include 90 to 95 percent of all diabetic cases, this type usually is seen in patient above 65 years old, in developed countries but the age of presentation in underdeveloped country is much lower.

The last class that called gestational DM, is a type of disease that causes problems for pregnant women, and is beyond the scope of this article.

In the following paragraph, we will discuss about the details of type one and two DM.

Type 1DM and Type 2DM:

Type 1 DM or insulin dependent DM or childhood DM:

In this type of disease the amount of insulin is not enough, therefore as a treatment we should provide external insulin, to meet the needs of body. The exact cause of this type of DM is not revealed but few infectious diseases such as mumps might be involved.

As previously mentioned, this type of diabetes (type 1DM) usually occurs in

children ,but the most common type of DM in less than 20 years old is type 2 DM.

Type 2DM which is also called insulin resistant DM:

In this type of disease the sufficient or even more than normal of insulin is produced in body, but the cellular response is impaired, in other words the normal level of insulin is not sufficient to open the gate of glucose at cellular level.

Therefore as medical treatment, at early stage of disease we prescribe the drugs, either to reduce the glucose level of blood or to force the pancreas to produce more insulin.

It should be noted that in the course of progression of disease we even prescribe external insulin to control the blood glucose level.

The consequence of high blood glucose level:

In the absence or resistance to Insulin, the glucose that is released from liver or absorbed from gastrointestinal tract, will remain in the blood, and consequently the blood level of glucose will rise.

Deprivation of cell from its main fuel, will bring some sort of starvation that represent itself with desire of the patient to have more food or beverage which called hyperplasia or polyphagia.

On the other hand, the excessive amount of glucose will appear in the urine which causes more urination that is called polyuria.

In the course disease, the main body organs including heart, kidneys, GI tract and..., would be affected and different

kind of functional and anatomical abnormalities would emerge.

Presentation of diabetes mellitus:

We could classify this presentation to acute and sub-acute and chronic type. It should be stated, that most of the patient are unaware of their own disease, therefore the presentation might in a wide range.

According to the above, mentioned physiopathology the usual presentation of DM is starvation, polyphagia and polyuria.

In addition we have some clue in the general appearance of the patients.

In class 1DM, the usual case is a child with lean body and polyphagia and polyuria.

On the other hand the patient with type 2DM is usually a patient, aged more than 50 either overweight or obese, with polyphagia and or polyuria.

But the acute presentation of the disease could be more different ,on the other hand ,the very high blood level of glucose (above 600 to 900 mg/dl) and coma that is called hyperosmolar coma, could be the first presentation of type 2DM.

On the other hand, high level of blood glucose (above 300 to 600 mg/dl) and ketosis smell and coma that named Ketoacidotic coma might be the first presentation of type 1DM.

Screening and diagnosis of diabetic patient by lab tests:

Screening means examination of a group (i.e. a crew member of a ship) to separate well persons from those who have an undiagnosed pathologic

condition (DM) or who are at high risk (Pre-diabetics).

Pre-diabetics, means that case has high risk of DM.

The common test that is used for screening and diagnosis of DM is FBS (fast blood sugar).

The case should fast overnight (for about 8 hours) from any sugar contained stuff, the result of this test (FBS) in normal case is below 100mg/dl.

Those who suffered from DM usually have FBS more than 125mg/dl.

Those whose results are between 100 to 125 are named Pre-diabetics.

Few other tests that are used to diagnose DM:

- 1- Glucose challenge test (GCT), in this test 75 gram glucose is given to an adult person, and after 2 hours the blood glucose is assayed.

If the glucose level is above 200mg/dl the case is diabetics.

If the glucose level is between 140 -200mg/dl the case is Pre-diabetics.

If the glucose level is below 140 mg/dl the case is normal.

- 2- Oral glucose tolerance test (OGTT) the test almost has the same procedure as (GCT) but the frequency of blood sampling is more.

- 3- HgA_{1c}: this test shows the mean blood glucose level of the patient since last 3 months.

This test is used usually for following up of diabetic cases, but sometimes, as a complementary test for Pre-diabetics states.

Presence of any abnormal results in the above mentioned tests, give us a clue for DM.

Screening has a cost, therefore it usually is performed, in special group, for example FBS as a screening test performed in above 65 years old, or those who have family history of DM and are above 45 years old.

This test (FBS) is also performed, as pre-employment medical exam, therefore presence of any result above 100mg/dl should guide us to further study such as those mentioned above(OGT,GCT,HgA_{1c}).

Our crew member that was afflicted by coma at sea site, had FBS=109, that means he was at least at pre diabetic state.

Few guidelines to prevent and control DM

Nakhjavani Emerit Professor of Tehran university, who has subspecialty in endocrinology, said: life style, diet, obesity, smocking, high blood pressure, are those factors that could be controlled, and by this method you could control your diabetes or even prevent this disease.

Those who are at pre diabetic state (FBS=100-125mg/dl) should consider following comments;

Keep body weight at normal range, have a low sugar and high fibre diet, have at least 30 minutes exercise 5days/week, sleep at proper and same time, keep in touch with a nutritionist and a physician.

Summary and conclusion:

Evaluation of health status of crew members, especially before any mission on board is mandatory. These evaluations are based on current instructions.

In order to have an efficient corporation, review and close inspection of current instructions and updating them, is an obligation.

We expect that, this introductory article brings more attention of the related authorities to DM and other Ohroic disorders, such as cardiovascular (e.g. high blood pressure) hepatic and renal diseases.

Section 3: Comments on loss prevention and lesson to learn

Recalling the case which has been explained in part 2, diabetic crew member has been transferred to hospital finally with the utmost attempt of owner and it's P & I in co-operation with other related parties.

But what was happening if he could not be transferred to hospital?

Answer is **death**.

Having a look at the real scenario and all related incurred costs and expenses in such particular case and considering it with the same case that could have occurred in different stages of the ship's voyage, following expenses would have incurred separately or in combination:

- 1- Periodical screening with a reputable laboratory result of FBS (fast blood sugar) for

- detecting type and severity of diabetes, while they are on board, to see if the crew member is suffering from diabetes or not.
- 2- Hospitalization.
 - 3- Normal transportation costs which may be hiring the fast boat to extensive charges of chartered chopper.
 - 4- Any diversion/deviation costs.
 - 5- Disability.
 - 6- Death.

Therefore with regard to patient's condition, the ship's situation and its route, the amount of costs may vary in above ranges.

Loss prevention:

As we know that the cost of diagnosis and preventing measures is much lesser than the cost of medical treatment, we offer medical departments of all our members to have a special focus on suspected initial laboratory results in first stage (i.e.: renewal of medical certificate) by suspecting any crew member that having a fast blood sugar (FBS) of above 100 in unit.

If the amount of FBS gets higher than 100 till 125, then it means we have to refer to following test which has been well explained in the above mentioned text of article:

- 1- Glucose challenge test (GCT).
- 2- Oral glucose tolerance test (OGTT).
- 3- Hg A_{1c}

So in case of any kind of diabetes, the below stages is advised to prevent furthered loss and accident on board:

- 1- To determine and diagnose the exact type of diabetes by medical department.
- 2- To advise the patient of all required treatment that must be taken into account by himself.
- 3- In accordance with STCW/circ.19 (Appendix F: guidelines on the medical examination of seafarers), to indicate in the crew member's medical certificate with any condition, restriction and medication imposed.
- 4- To inform responsible staff of company's fleet personnel about the patent condition clearly for nominating appropriate vessel for him, if his joining is admissible.
- 5- Fleet personnel to inform the master about the patient's special condition.

Lesson to learn:

By defrayment of meagre sum for preventing and diagnosis the disease in initial stages, definitely we could prevent extensive costs and compensation in future.