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EFFECTS OF MARIJUANA ON SODIUM AND POTASSIUM (NA^+ & $P^{+)}$ IONS HOMEOSTASIS AMONG SMOKERS IN BENIN CITY- A METROPOLITAN CITY IN NIGERIA

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ABSTRACT

Serum sodium and potassium ions levels of marijuana smokers were estimated using atomic emission flame spectrophotometry on hundred (100) subjects comprising sixty (60) marijuana smokers and forty (40) non -marijuana smokers. The non smokers were apparently healthy subjects that served as controls. The mean of serum Na^+ and K^+ levels of marijuana smokers were 119±26mmol/l and 2.3±0.7mmol/l respectively, while the controls had 140±6mmol/l and 3.8±0.5mmol/l respectively. The results obtained showed that there is statistical difference in serum (electrolyte) sodium and potassium levels of marijuana smokers compared with non-smokers control ($P<0.05$).This work reveals that there is decrease in serum Na+ and K+ levels in marijuana smoking .Hyponatreamia and hypokelamia are the probable causes of these various mobility and mortality associated with this habit. It is suggested that marijuana smoking should be avoided.

KEY WORDS

Marijuana, Kidney, electrolyte .sodium and potassium Benin City, Nigeria.

INTRODUCTION

Marijuana refers to dried leaves and flowers of cannabis sativa in plants that contains the psychoactive chemical Delta-9-tetra hydrocannabinol (THC) at various levels of concentration [1] .The kidneys have the function of excreting waste products of metabolism and play essential homeostatic role of maintenance of the interior of the by adjusting or controlling the excretory of water and different plasma constituent [2 ,3].Electrolytes are minerals found in the blood stream (plasma) and other body fluids that carry electric charges. Electrolyte balance is necessary for normal of cells and organs. They exist in the blood as acids, bases and salts such as sodium, calcium, potassium, chloride, magnesium and bicarbonate. Marijuana, when

inhaled, the active chemical rapidly passes from the lungs into the blood stream which carries the chemical to organs throughout the body, thereby having effect on these organs. [4].

Marijuana and its active chemical components have been shown to have adverse effects on male fertility. These effects can manifest in form of lowered sperm count, abnormal spermatozoa shape and even functionality of the testis [5].

MATERIALS AND METHODS

A total of 100 subjects comprising of 60 marijuana smokers and 40 subjects who are apparently healthy who gave their informed consent to carryout the experiment and sample collection.

The smoking status of all subjects was established using questionnaire. Venous blood samples were collected into lithium heparin bottles from marijuana smokers one (1) hour of smoking.

BIOCHEMICAL ASSAYS

The parameters to be established namely; sodium (Na+) and potassium (K+) were determined using standard procedures of atomic emission spectrophotometry.

STATISTICAL ANALYSIS

The groups mean ± S.D was calculated for each analyte and significant difference between means evaluated using the student t-test, with $P<0.05$ considered as statistically significant.

RESULTS AND DISCUSSION

In this study, the electrolytes (Na+ and K+) status of hundred (100) subjects was investigated. The results obtained from this study showed a general decrease in the levels of Na+ and K+ in marijuana smokers.

TABLE 1

Mean ± S.D of Na+ and K+ of marijuana smokers and non-marijuana smokers.

Electrolyte	Marijuana Smokers n=60	Non-marijuana smokers (controls) n=40	I-value	P-value
Sodium (Na+) (mmol/L)	11.9 ± 26.0	140.0±6	6.0	P<0.05
Potassium (K+)(mmol /L	2.3 ± 0.7	3.8 ± 0.5	11.0	P<0.05

The electrolytes (Na+ and K+) were significantly reduced ($P<0.05$) in marijuana smokers when compared with control subjects. The Negative influence of marijuana smoking on the electrolyte profile in the table above agrees with the work of [1] and who reported that marijuana smoking decreases potassium (K+) levels in smokers. Also it agrees with the work of [6] who reasoned that some drugs, loss of salt and water would lead to a decrease in sodium levels. The reason for the observed hyponatraemia and hypokalaemia in this study may be due to any of the following reasons: Tachycardia i.e. heart rate more than 100beats per minute in adults is one of the main peripheral effects of marijuana on its smokers. Secondly, marijuana affects human endocrine glands. Testosterone has been shown to be decreased in marijuana smokers. According to Guyton and Hall [7], mineral corticoids deficiency (i.e. testosterone) causes severe renal wasting of sodium chlorides and hyperkalemia. Aldosterone which is a hypothalamus may also be affected by marijuana smoking and indirectly may affect sodium

balance resulting in hyponatreamia.Thirdly marijuana contain an active ingredient known as cannabinoid. This cannabinoids according to Rang *et al* [8] is linked to the inhibition of adenylate cyclase and effect calcium and potassium channel function to bring inhibition of synaptic transmission. This effect of the cannabinoids receptor on potassium channel may be the cause of hypokalemia in marijuana smokers.

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