THE EFFECT OF IBUPROFEN ON ESR AND PAIN (A CASE STUDY OF DYSMENORRHEA)

George, Daye Mandy.C*1, Bagbi Baribefe Monday2, Kingsley Okpara3

1Dept. of Pharmacy, Rivers State College of Health Science And Technology, Port Harcourt, Nigeria.
2Clinical Pharmacist, Befex-B Pharmacy, Port-Harcourt, Nigeria
3School of Medical Laboratory Sciences, Rivers State College of Health Science and Technology, Port Harcourt, Nigeria.

ABSTRACT

Investigation into the effect of Ibuprofen, a non steroid anti-inflammatory drug (NSAID) on the Erythrocyte Sedimentation Rate (ESR) and pain in dysmenorrhoea was done by randomly choosing 50 adolescent girls. On the onset of their menstrual flow, the ESR of these girls was determined using the wintergreen method when they have not been loaded with Ibuprofen tablets. They were then loaded with varying strengths of Ibuprofen (400mg-1200mg) tablets during their menstrual flow, and their ESR determined after four hours from the intake of the drug. The result obtained, showed that Ibuprofen drastically reduced both the ESR and relieved pains associated with primary dysmenorrhea in 25 girls, while it had no effect on 15 girls with secondary dysmenorrhea and 10 girls who had no dysmenorrhea. This means that Ibuprofen tablet is a potential pain killer in primary dysmenorrhea in adolescent girls. Hence, an important treatment option for the millions of adolescents who experience high morbidity from dysmenorrhea and are currently undertreated.

Keywords: Ibuprofen, dysmenorrhea, ESR and pain.

1. INTRODUCTION

One of the major physiological changes that take place in adolescent girls is the onset of menarche, which is often associated with problems of irregular menstruation, excessive bleeding, and dysmenorrhea. Of these, dysmenorrhea is one of the common problems experienced by many adolescent girls [1].

Dysmenorrhea is the medical term for pain with menstruation. There are two types of dysmenorrhea: “primary” and “secondary”. Primary dysmenorrhea is defined as a painful menstruation in the absence of organic pathology. It is prevalent during adolescence. Cramps usually begin one or two years after a woman starts getting her period. Pain usually begins 1 or 2 days before or when menstrual bleeding starts and is felt in the lower abdomen, base, or thighs and can range from mild to severe. Pain can typically last 12 to 72 hours and can be accompanied by nausea, vomiting, fatigue and even diarrhea.

Secondary dysmenorrhea is pain that is caused by a disorder in the woman’s reproductive organs, such as endometriosis, adenomyosis, uterine fibroids, or infection. Pain from secondary dysmenorrhea usually begins earlier in the menstrual cycle and last longer than common menstrual cramps. The pain is typically accompanied by nausea, vomiting, fatigue, or diarrhea.

Most adolescent girls in varied populations report experiencing dysmenorrhea and approximately 15% described the pain as severe[2,3]. Morbidity due to dysmenorrheal represents a substantial public health burden. Based on estimates from U.S census, approximately 2 million adolescents or 15% of the total females aged 13-19 years, experience severe dysmenorrhea. According to [4], dysmenorrhea is the single greatest cause of loss of working hours and school absenteeism in adolescent girls.

Dysmenorrhea may have a pronounced impact among adolescents due to under treatment. In a national probability sample [5] reported that only 14% of U.S. adolescents with dysmenorrhea sought for help from a physician, including only 29% of those reporting severe dysmenorrhea. Most adolescents who use pain medicine choose over-the-counter treatments such as non-steroidal anti-inflammatory drugs e.g. Ibuprofen.

*Corresponding Author www.ijesr.org
Ibuprofen is a chiral propanoic acid derivative belonging to the class of non-steroidal anti-inflammatory drugs (NSAIDs). Due to its analgesic, antipyretic and anti-inflammatory actions, it is used in the treatment of inflammatory conditions such as rheumatoid arthritis, osteo-arthritis, ankylosing spondylitis, mild and moderate pain, dysmenorrhea, vascular headache and fever.

This work of trial is therefore geared towards the use of ibuprofen tablet in the treatment of dysmenorrheal as a function of ESR levels and pain relieve.

2. MATERIALS AND METHOD

2.1 Chemicals and Reagents

The materials used in carrying out the experiment were purchased commercially from 96/98 Olu Obasanjo road, beside AP filing station by everyday super market junction, Port Harcourt, Rivers state, Nigeria. The anti coagulant EDTA (Ethylene diamine tetra acetic acid) was also purchased commercially from the same place. The 50 volunteers used for the experiment were randomly selected from the various schools in Rivers State College of Health science and Technology Rumueme mile 4 through dialogue.

2.2 Collection of Blood Sample and Administration of Ibuprofen Tablets

Venous blood was taken from each of the volunteers by the Medical laboratory Scientist in the College Medical laboratory, at the onset or during their menstrual cycle. ESR was conducted without any Ibuprofen intake. The volunteers were then loaded with varied strengths of Ibuprofen tablets ranging from 400mg-1200mg during their menstrual cycle. The ESR test was then repeated after four hours of ingestion of the drug using westergren method.

2.3 Erythrocyte Sedimentation Rate Test

2ml of venous blood was collected into the tube containing 0.5ml of sodium citrate. It was mixed and then aspirated into wintergreen Katz tube to the 200mm mark. The tube was then placed at room temperature at which time the distance from the lowest point of the surface meniscus to the upper limit of the red cell sediment was measured. The distance of fall of erythrocytes expressed as millimeters in 1 hour is the ESR.

3. RESULTS

From the results obtained, 40 out of the 50 volunteers had dysmenorrhea while 10 had no dysmenorrhea. A further breakdown revealed that 25 out of 40 dysmenorrhreal volunteers responded to Ibuprofen tablets of varied strengths as depicted in table 1 below.

Table 1: Volunteers that had dysmenorrhea that responded to Ibuprofen treatment

<table>
<thead>
<tr>
<th>No. of Volunteers</th>
<th>Dosage</th>
<th>ESR before intake of Ibuprofen</th>
<th>ESR after intake of Ibuprofen</th>
<th>Action on pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1200mg</td>
<td>20mm/hr</td>
<td>13mm/hr</td>
<td>Relieved</td>
</tr>
<tr>
<td>5</td>
<td>1200mg</td>
<td>28mm/hr</td>
<td>24mm/hr</td>
<td>&quot;</td>
</tr>
<tr>
<td>5</td>
<td>800mg</td>
<td>40mm/hr</td>
<td>36mm/hr</td>
<td>&quot;</td>
</tr>
<tr>
<td>5</td>
<td>800mg</td>
<td>25mm/hr</td>
<td>15mm/hr</td>
<td>&quot;</td>
</tr>
<tr>
<td>5</td>
<td>400mg</td>
<td>24mm/hr</td>
<td>23mm/hr</td>
<td>&quot;</td>
</tr>
</tbody>
</table>

The ESR values in the onset of menstrual cycle showed an increase above the normal ESR values of 5-7mm/hr in women, which is in agreement with the works of others, who reported that ESR levels of women during their menstrual cycle is usually high[6]. Again, the result in table 1 also indicated that the volunteers had their ESR values lowered as well as pain relieved, as a result of intake of varied strengths of Ibuprofen. Those who took higher doses of 800mg – 1200mg, had significantly dropped ESR values.

Table 2 revealed that 15 out of the 40 dysmenorrhreal volunteers had ESR values and pain not reduced. Their ESR values rather increased after the intake of Ibuprofen tablet of varied strengths with 1200mg producing the highest ESR value of 35mm/hr.
Table 2: Volunteers who had dysmenorrheal that didn’t respond to Ibuprofen treatment

<table>
<thead>
<tr>
<th>Volunteers</th>
<th>Dosage</th>
<th>ESR B4 intake of Ibuprofen</th>
<th>ESR After intake of Ibuprofen</th>
<th>Action on Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1200mg</td>
<td>28mm/hr</td>
<td>35mm/hr</td>
<td>Not relieved</td>
</tr>
<tr>
<td>5</td>
<td>1200mg</td>
<td>29mm/hr</td>
<td>39mm/hr</td>
<td>“”</td>
</tr>
<tr>
<td>5</td>
<td>400 mg</td>
<td>34mm/hr</td>
<td>35mm/hr</td>
<td>“”</td>
</tr>
</tbody>
</table>

4. DISCUSSION

This sharp drop and pain relief in table 1, could be attributed to the reversible inhibition of the enzyme cyclooxygenase (Cox) which is responsible for the biosynthesis of prostaglandins as leukotrienes from arachidonic acid present in the menstrual fluid [7,8]. Ibuprofen blocked and stopped the synthesis of the pain causing chemicals called pronstagladins.

Another factor responsible for the above result could be understood from the point of view that it is mostly primary dysmenorrheal that both ESR and pain levels are reduced. Therefore, primary dysmenorrheal could be implicated also for the results obtained in table 1[9].

Furthermore, studies have shown that oral contraceptives reduces both ESR values and pain levels in humans placed on it, but since volunteers were not on any oral contraceptive medication before now or during the experiment, but had their ESR reduced and pains relieved, It could also be inferred that the result was effected by Ibuprofen and not oral contraceptive.

The increased ESR values and continuous pain in table II, may be attributed to secondary dysmenorrhea resulting from infection, fibroids, ovarian cyst, endometriosis, adenomyosis (American college of obstetrian & Gynecologist, 2012).

Again It has reported that technical factors could also be responsible for elevated ESR values such as dilution problem, increased temperature of specimen, tilted ESR tube. It could be inferred that these also accounted for the observed results [10].

Finally, none clinically significant effects or questionable effects such as obesity, body temperature, recent meal and intake of some drugs have been reported to cause elevated ESR values. But since these girls were not on any of such medications, secondary dysmenorrhea is implicated in the observed result.

5. CONCLUSION

In conclusion, the result of this unique randomized investigation further supports the use of Ibuprofen for the treatment of primary dysmenorrhea in adolescent girls. Therefore, Ibuprofen should become an important treatment option for millions of adolescents who experience high morbidity from dysmenorrhea and are currently undertreated.

REFERENCES

