The Results of the use of Teriparatide for Prevention in both Vertebral and Non-Vertebral Fractures in Postmenopausal Osteoporosis

A Systematic Review of Literature

Essay

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رسالة

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بسم اللّٰه الرحمن الرحيم
"ذلك فضل الله
يؤتيه من يشاء والله
ذو الفضل العظيم"
صدق اللّٰه العظيم
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" ايه (٤) "

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LIST OF ABBREVIATION

BMD	Bone Mineral Density
CI	Confidence interval
DANCE	Direct Assessment of Nonvertebral Fractures in Community Experience
DEXA	Dual-energy X-ray absorptiometry
FPT	Fracture Prevention trial
FRAX	Fracture Risk Assessment Tool
MORE	multiple outcomes for raloxifene evaluation
NVFX	nonvertebral fragility fractures
rhPTH	recombinant human parathyroid hormone
RR	Relative risk
SD	Standard deviation
TOWER	Teriparatide Once-Weekly Efficacy Research

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Abstract

Background : Teriparatide , a synthetic parathyroid hormone ,increase the bone formation and bone mass . The known regimen is 20 mcg /day, through the subcutaneous injection**. Method :** Searching electronic database for its effect on prevention of both vertebral and non-vertebral fractures among postmenopausal women with osteoporosis . **Results :** Through 23 results, following the inclusion criteria , incidence of both vertebral and non-vertebral fractures was significantly decreased with teriparatide treatment , with different dosage (20mcg/day , 56.5 mcg/week and 28.2 mcg/week) . **Conclusion :** teriaparatide decrease the risk of both vertebral and non-vertebral fractures among postmenopausal women with osteoporosis , and the effect on vertebral fractures being higher.

Keywords: Teriparatide , postmenopausal osteoporosis , vertebral fracture , non-vertebral fractures , incidence of fracture ,

INTRODUCTION

In 2001, the National Institutes of Health Consensus Development Panel on Osteoporosis issued a consensus definition of osteoporosis: 'Osteoporosis is defined as a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture' ***(Lorentzon, 2015).***

According to WHO, it could be defined as a decrease in bone mineral density by more than 2.5 standard deviation below mean value of adult ***(Parveen et al., 2005).*** Among different causes of osteoporosis, postmenopausal osteoporosis is being the most common ***(Colledge et al., 2010).*** In modern Egypt, it has been estimated that 53.9% of postmenopausal women have osteopenia and 28.4 have osteoporosis ***(Mohy, 2011).***

The clinical importance of osteoporosis lies in the fact that it is a risk factor for fractures and the risk of fracture increase by a factor of 1.5 to 3 folds for each SD reduction in BMD ***(Court Brown et al., 2014).*** Fractures related to osteoporosis are estimated to affect around 30% of women and 12 % of men at same point in developed countries ***(Colledge et al., 2010).***

Osteoporotic fractures can affect any bone but the most common sites are spine, hip and forearm (Colle's) and hip fractures are the most serious ***(Colledge et al., 2010).***

Approximately 30% of women sustain a vertebral fracture by age of 70th and 50% by age of 85 years old ***(Bouxsein et al., 2009).***

The main goal of osteoporosis therapy is to reduce fracture risk ***(Gallager et al., 2006).*** Several drugs have been shown to reduce the risk of osteoporotic fractures in randomized controlled trials, including both vertebral and non-vertebral fractures ***(Colledge et al., 2010).***

Teriparatide [rhPTH (1-34), TPTD] is the only bone forming drug approved by the US Food and Drug Administration for treatment of men and postmenopausal women with osteoporosis at high risk for fracture ***(Gennant et al., 2005; Silverman et al., 2013).***Treatment with subcutaneous daily injections of teriparatide induces new bone formation by increasing the rate of bone remodeling, trabecular connectivity, and cortical bone thicken ***(Dempster et al., 2001; Jiang et al., 2003; Comptson, 2007).*** Teriparatide improves the biomechanical properties of bone ***(Keaveny et al., 2007).***

AIM OF THE WORK

A systematic review of literature to compare the results of usage of teriparatide for prevention of both osteoporotic vertebral and non-vertebral fractures in postmenopausal women.

MATERIALS AND METHODS

a- Search strategy: (fig1)

A literature search of the electronic databases of PUBMED (1995-July 2016 was conducted, using the following keywords “Teriparatide”, “vertebral fracture”, “non-vertebral fracture” and "postmenopausal osteoporosis" were used. The search was developed, conducted and was last updated in July 2016.

b- Criteria for selecting studies for this review:

1. Types of included studies:

- Published studies from 1995 – July 2016
- Published randomized controlled trials, Prospective studies.
- Written in English language only.
- Human studies only.

2. Types of excluded studies:

- Animal studies
- In Vitro studies
- Studies include in related surgical interference
- Studies related to the usage of teriparatide for treatment of non union or acceleration of healing process.
- Studies on male patients only.
- Pilot study.