Peptide Therapy

Malory Yockey
bogantzm@yahoo.com

Follow this and additional works at: https://digitalcommons.otterbein.edu/stu_msn

Recommended Citation
Yockey, Malory, "Peptide Therapy" (2019). Nursing Student Class Projects (Formerly MSN). 350.
https://digitalcommons.otterbein.edu/stu_msn/350

This Project is brought to you for free and open access by the Student Research & Creative Work at Digital Commons @ Otterbein. It has been accepted for inclusion in Nursing Student Class Projects (Formerly MSN) by an authorized administrator of Digital Commons @ Otterbein. For more information, please contact digitalcommons07@otterbein.edu.
Peptide Therapy
Malory Yockey, BSN, RN, CMSRN
Otterbein University, Westerville, Ohio

What are peptides?

Reason for Choosing Topic

There are many ways to heal the body. Modern medicine is one of the greatest innovations of all time, but it is important to also understand that there are also many alternative therapies available. The human body contains peptides, which are chains of amino acids that make up proteins, however, they can also be made artificially (Suna, Care, & Berglund, 2017). The idea of taking a component already found in the body and enhancing it is the idea behind using peptide therapy. Peptides can be used for so many different ailments and help the ability to help everyone in one way or another. Although there is a lack of knowledge on the subject matter, peptides are more commonly used than most would expect. Since peptides make up proteins, it is important to note that the first protein that was created for medicinal use was insulin (Usham et al., 1971). The pathophysiology behind the idea of peptides is in depth, but also can sponsor the bioavailability of the treatment. Peptides can have so many side effects with the never-ending list of ailments. Peptides offer a more natural approach to healing that provides many benefits. The purpose of this study will be focusing on two peptides and the many valuable capabilities they possess. Several studies regarding the effects of the following peptides were utilized to further explain the benefits of peptide therapy.

Table 1. Source or chemical nature of early peptides (Lau & Dunn, 2018)

<table>
<thead>
<tr>
<th>Peptide</th>
<th>Source</th>
<th>Introduction to the clinic</th>
<th>Sequence description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apathin</td>
<td>Isolated from canine ultimobranchial gland</td>
<td>Native</td>
<td>1920s</td>
</tr>
<tr>
<td>Adrenocorticotropic hormone (ACTH)</td>
<td>Isolated from bovine pituitary glands</td>
<td>Native</td>
<td>1950s</td>
</tr>
<tr>
<td>Calcitonin</td>
<td>Isolated from salmon ultimobranchial gland</td>
<td>Native</td>
<td>1971</td>
</tr>
<tr>
<td>Leuprolin</td>
<td>Synthetic</td>
<td>Native</td>
<td>1982</td>
</tr>
<tr>
<td>Leuprelin</td>
<td>Synthetic</td>
<td>Native</td>
<td>1982</td>
</tr>
<tr>
<td>Leuphelin</td>
<td>Synthetic analog of somatostatin</td>
<td>1988</td>
<td>Cyclic octapeptide analog of somatostatin-14</td>
</tr>
<tr>
<td>Leupanepin</td>
<td>Synthetic analog of gonadorelin</td>
<td>1984</td>
<td>Nonapeptide analog of decapeptide gonadorelin</td>
</tr>
</tbody>
</table>

Signs & Symptoms

Indications for peptide therapy are vast. Healing is required for all disease processes; therefore, the usage could be widely appreciated. Possible ailments that cause varying degrees of signs and symptoms could benefit from the usage of peptides. A few examples include:

- Wounds
- Peptic ulcers
- Fractures
- Muscle injuries
- Cancers
- Autoimmune diseases
- Cardiac injuries
- Anti-aging treatments

Introduction

There are many cationic medications that have been around for a long time and many people would be surprised to know that they are actually peptides (See Table 1). There is a long way to go before peptides are more widely used, but there are around 150 being tested for use and 60 that are already approved for use (Lau & Dunn, 2018).

Underlying Significance

Understanding peptides in the body has led to the creation of artificial peptides that mimic these effects. Synthetic peptides can be used as:

- Antagonists
- Agonists
- Enzyme substrates
- Enzyme inhibitors

Due to limited availability of human resources, the use of artificial peptides is needed, especially in the presence of disease. Peptide drugs can be developed by understanding the design of any naturally occurring peptide structure and synthesis.

Case Study

The purpose of this study was to examine the effects of BPC 157 on musculoskeletal injuries via intramuscular and topical administration.

This study was done on small rodents with a variety of different tendon, ligament, and skeletal muscle injuries. The conclusion showed positive results for soft tissue injuries with the use of artificial peptide therapy. (Geyer, Wragg, & Wilson, 2019)

Thymosin Beta 4 (Tβ4)

- Muscle
- Cartilage
- Wound healing
- Cardiac injuries

Study 1

The purpose of this study was to study the topical use of BPC 157 on burn injuries.

The study was completed with the use of anesthetized alkali-burned rats. The conclusion showed that the peptide accelerated wound closure.

On day 18, the treated rats had 80% closure while the untreated group only had 60%. These results were positively correlated with a previous study done on rats burned by open fire. (Huang et al., 2015)

Study 2

The purpose of this study was to research a peptide derived from stool and known as BPC 157.

The peptide was tested for its effects on tendon fractures from the Achilles tendon of rats using culture plates and microarray analysis. The test was conducted in different levels and with the addition of growth factors.

The conclusions were in accordance with previous studies and showed that the peptide to promote healing in arteries, tissue, bone, skin, and muscle.

The use of the BPC 157 naturally increased the growth hormone and would be a cost-effective alternative to promote healing. (Chang, Yai, Hu, & Su Pang, 2014)

Study 3

The purpose of this study was to examine the effects of BPC 157 on musculoskeletal injuries via intramuscular and topical administration.

This study was done on small rodents with a variety of different tendon, ligament, and skeletal muscle injuries. The conclusion showed positive results for soft tissue injuries with the use of artificial peptide therapy. (Geyer, Wragg, & Wilson, 2019)

Study 4

The purpose of this study was to test the topical use of BPC 157 on burn injuries.

The study was completed with the use of anesthetized alkali-burned rats. The conclusion showed that the peptide accelerated wound closure.

On day 18, the treated rats had 80% closure while the untreated group only had 60%. These results were positively correlated with a previous study done on rats burned by open fire. (Huang et al., 2015)

Study 5

The purpose of this study was to examine the many uses of Thymosin, including T4.

Research was completed on the many uses of this peptide, including angiogenesis, growth, and inflammation.

Data was collected on a variety of subjects including mice, dogs, and even humans.

Conclusions showed positive results that included inhibiting ischemia and other heart injuries.

Discussion of future studies using this peptide for cardiac disease are in progress with the hypothesis of positive effects for all types of injuries. (Kuran, 2016)

Discussion

There are many avenues that need to be explored in regard to the use of peptides. The need for new traditional therapies will always continue, but the use of same therapy could be a beneficial step. When new peptide therapy is performed, patients suffer from chronic wounds and have difficulty healing due to comorbidities, the use of peptides could be a very interesting option to consider. Studies that have been completed have only shown positive results, therefore, they perfectly fill a place for peptide therapy. This could possibly be the future of medicine and with continuous research may end up becoming a more popular option in the world of traditional medicine.

References

Sewald & Jakubke, 2015

Sewald & Jakubke, 2015