ISSN 2692-5877
DOI: 10.46998/IJCMCR.2022.22.000528

International Journal of
Clinical Studies & Medical Case Reports

Case Series

Explosive Hypertrophy Development: 5RD method, advanced way for explosive hypertrophy, Cases Report Series Research

Khaled Hamlaoui[1], Dario Furnari[1],* and Nadya Khan[2]
Department of Biomedical Sciences, Hospital, Netherland, United Kingdom
Department of Pharmacology, College of Medicine and Health Sciences, UAEU

***Corresponding author:** Dario Furnari, Department of Biomedical Sciences, Hospital, Netherland, United Kingdom

Received: September 03, 2022 **Published:** September 26, 2022

Abstract

The knowledge of muscle function plays a major role in bodybuilding training and makes big difference for bodybuilders.

Muscle monitoring is of great interest in areas such as clinical assessment, and sport science. Understanding, ideally quantifying, when a muscle state has changed in relation to whole body motion can assist in physical training and muscle conditioning.

There are lot of different methods to gain muscle mass and improve weak parts; bodybuilders been using those methods for decades such: drop-set, rest-pause, super-set, tri-set, giant sets, contrast time, multi hold pump set, intra set load contrast, regressive range of motion, iso dynamic contrast

Our method is based on scientific work; our main goal is to improve bodybuilder's weak muscles and increase muscle mass in very short period of time, to asses our work we used Electromyography (EMG) to assess the skeletal muscles activity and Ultrasonography (US) to measure muscle thickness.

Bodybuilding is the use of progressive resistance exercise to develop the musculature, is the process of developing muscle fibres through the combination of weight training, increased caloric intake, and rest. Bodybuilding decreases risk of developing diseases, Improve Mental Health, simply Weight training exercise, aerobic exercise and right nutrition have beneficial effects for strong mind and body. Muscle hypertrophy is a term for the growth and increase of the size of muscle cells. Hypertrophy is, by definition, the enlargement of an organ or tissue from the increase in size of its cells. Not to be confused withhyperplasia, the process of increasing the number of cells, hypertrophy is the process of increasing the size of the cells that are already there.

By that a hormonal response is triggered, so a release of growth factor, cortisol, and testosterone. Growth factors help stimulate muscle hypertrophy while testosterone increases protein synthesis. This process makes satellite cells multiplying and their daughter cells go to the damaged tissue.

To build muscle through weight lifting, you need to have both mechanical damage and metabolic fatigue. When you lift a heavy weight, the contractile proteins in the muscles must generate force to overturn the resistance provided by the weight.

Keywords: Exercise Science, Nutritional Biochemistry, Training Exercise, Body Building, Inflammation, Skeletal Muscle, Hypertrophy, Hyperplasia, Deymed EMG, muscular activity, muscular function

Introduction

The bodybuilder is the one who, through a high-calorie diet and training focused on the use of dumbbells and strength machines, aims to increase muscle mass, far exceeding the normal proportions and anthropometricmeasuresfound in the average population.The bodybuilder is often confused with the weightlifter but there is a clear difference between the two.

Muscular Hypertrophy: Muscle grows significantly when subjected to a stressful stimulus.

Overloading represents the specific stimulus that produces hypertrophy, i.e. the increase in muscle mass due to the increase in the size of the individual fibers.

Satellite Cells and Muscular Hyperplasia: These are fibers deriving from the mesoderm germinative sheet from which muscle tissue originates.The satellite cells, arranged between the endomysium and muscle fibers, represent a growth reserve that intervenes in the event of damage.The number of satellite cells is genetically pre-determined;they are adjacent to the fast twitch fibers (IIa and IIx).

When there is sufficient testosterone in the circulation, the nerve impulse becomes so intense that it forces the muscle to contract beyond a certain threshold.Only in this way the stimulus that tears the connective tissue of the fibers is realized.

Hypertrophy is an increase in the size of muscle tissue. This

encompasses increases in the contractileelements of a muscle (ie the fibers) and a concomitantexpansion of the extracellularmatrix. When we lift weights a whole bunch of jiggery-pokery (that's a technical term used in molecularbiology) results in the addition of contractileunits in parallel, leading to an increased diameter per fiber and thus an increase in muscle cross sectional area.

Hypertrophy CAN also happen in series to adapt to a new functional length (eg in the case of previously immobilized limbs) and as a response to eccentric training. While that might be important for injury prevention and rehab, it'snot really the focus of people getting swole so we won'tget toointo that. Similarly, whilst hyperplasia (the addition of new fibers, as opposed to growing existingones) has been demonstrated in some animal models, it doesn'tappear to happen with training. Off the top of my head there was some research showing a greater total number of muscle fibers in bodybuilders than regular folks, but that didn't demonstrate that the disparityaroseas a result of training per-se, ratherthat bodybuilding might just select for those with higher than average muscular potential.

Of some importance, also, is the idea of a "myonuclear domain". Muscle tissues are multinucleated – the little powerhouses that actually synthesise new proteins distributed along the long muscle cells. Myonuclei can only oversee a given amount of cell volume, and so eventually for growth to occur additional nuclei have to be added.

So in addition to the before mentioned jiggery-pokery that allows us to synthesise new muscle tissue, it's presumed that at some point you need satellite cells to differentiate into additional nuclei to facilitate this, and researchers have found more or lessthis, with only modest growth possible without the addition of myonuclei.

Quite cool (and again quite irrelevant to the article at hand) is that additional myonuclei appear to stay around even when we atrophy (lose size), which facilitates regain of muscle size (so-called muscle memory). I recently learnt that there's a bit more to it than that, with some cool epigenetic stuff going on too, but the point is you need enough little muscle-making factories distributed along your muscle fibers to grow and I'llleave it there.So hypertrophy is the addition of contractice and non-contractile elements to muscle tissue. In response to training it happens mostly by the addition of contractile elements in parallel. The question is WHY/what causes it .

As with everything, our adaptations are fundamentally a response to imposed stressors. We have a baseline level of muscularity, are existing in a nice little homeostatic comfort zone, suffer a perturbation (training), and respond to that by fortifying the systems that weres tressed. There is a threshold of stress required to actually induce adaptation, and as the systems geting resilient that threshold increases.In muscle hypertrophy, 3 major drivers of growth have been identified: Muscle Damage, Mechanical tension, Metabolic stress.

EMG instrumental diagnostic examination

Upper limb electromyographyis a neurological diagnostic test that evaluates all pathologies and abnormalities existing on the peripheral nervous system in correlation with the muscular system of the upper limbs. Electromyography is also indicated by the abbreviation EMG and is a very common diagnostic procedure that investigates the health of muscles in correlation with the nerve cells that control them.

This examination is carried out through the application of small electrodes that transmit and detect electrical signals emitted by nerve cells. The electrode is needle-shaped and is inserted into the muscle in order to record the electrical activity that it carries out. Other electrodes will also be applied directly to the skin of the upper limb and which are used to detect the speed and mode of movement of the signals emitted by following a point path. The exam takes place in two phases. The first is used to ascertain the speed with which an electrical stimulus travels a nerve, while the second is inserted into the needle-shaped electrode at rest, in contraction and in maximum contraction of the affected muscle. In body building or other activities Electromyography measures the electrical activity of the muscles during exercise.

Although the EMG does not directly measure muscle tension, the two should be very similar, since the electrical activity that EMG measures is simply a measurement of the signal from the nervous system to the muscles. An increased EMG activity is indicative of the nervous system's attempt to produce more muscle strength.

Research indicates that EMG very carefully models muscle strength (tension) with isometric contractions. However, the more dynamic the movement and the more fatigue it triggers, the more the EMG moves away from the tension estimates. Furthermore, with coarse movements and superficial muscles, the surface EMG is quite reliable, but for accurate movements and deep muscles a thorough EMG is required for accurate estimates.

Deymed Diagnostic EMG

In our research we used the Deymed EMG, a two-channel electromyograph.

The first ever battery-powered EMG system that offers the highest quality nerve conduction, EMG and EP examinations. Modern design with unified elements for practical use and of great aesthetic effect. The fast and easy-to-use software interface combines powerful customizations and preset protocols for immediate use.

Deymed's new ultra-low-capacity induction charger keeps batteries full when the system is not in use. This ensures the highest signal quality with battery operation during sensitive neurophysiology tests. Optical isolation greatly improves signal quality and patient safety. This feature, combined with long-lasting battery operation, offers best-in-class technology for neuro physiological recordings.

Experimental Procedure

Methods

Thirty (30) male participants (age 25 ± 7 years, body mass 80 ± 9 kg, height 182 ± 7 cm) with at least 5years resistance training experience (four resistance training sessions per week). All participants were right hand dominant and were divided into 5 groups, we tested the 5RD method for 04 weeks, each group focusing on different muscle group to improve:

-Group 1 = Shoulders (deltoid).

-Group 2 = Back (specifically latissimus dorsi, teres major, rhomboids).

-Group 3 = chest (specifically pectoralis major)

-Group 4 = biceps & triceps (specifically triceps brachi lateral head)

-Group 5 = quadriceps and hamstrings (rectus femorisvastus-lateralis and vastusmedialis, biceps femoris and semimembranosus).

For the muscle activity measurement, we used Deymed EMG traveler.

TechnicalSpecification

Product Specification	Amplifiers
Number of channels	2, 4, 4EP, 8, 8EP, 8EP+8 (16ch), 8+8 (16ch)
Analog time constant	3.2, 0.32, 0.02
Analogsampling frequency	50 kHz per Channel*
IMR	140 dB **

Deymed EMG traveler measures muscle response or electrical activity in response to a nerve's stimulation of the muscle,in response to a stimulus from the neuron, a muscle fiber depolarizes as the signal propagates along its surface and the fiber twitches. This depolarization, accompanied by a movement of ions, generates an electric field near each muscle fiber.

On the other hand, the muscle may show abnormal electrical activity during contraction. This shows up as an abnormal action potential pattern with changes in the size or shape of the wave. Abnormal EMG results may indicate muscle damage or a problem with the nerves that control the muscle.

Before testing our method, we performed tests to identify dysfunctional muscle activity, all participants at the time of the study did not present any pathology

The 5RD METHOD, (the details of the method are under copyrights rules)

For example, the weak part is back muscles and specifically latissimus dorsi, teres major, rhomboids.

The good exercise for these muscles is T-bar rows so we performed 4 sets of 8 repetitions and in the last set we performed the 5RD METHOD, the exercise was performed correctly and with total tension and the rest time between sets was 1 minute 30 seconds TO 2 minutes.

Note: This method required a special diet and special supplement regimen as well, before, during and after training and everything was based on scientific methods and specific dosage of everything that changes with every individual.

Results:

We performed a comparison test between other popular training methods (drop set and rest pause) with our 5RD METHOD.

-Greater muscle activation in 5RD than drop set and rest pause.

-The 5RD resulted in the greatest repetition impulse in comparison with drop set and rest pause.

-The timing of contractions becomes more co-ordinated.

-Neural pathways linking to target muscles become more efficient at transmitting the message (stimulus).

-The ability to summate (fire a lot of impulses in target muscles all at once) is improved with 5RD.

-Most important, greater muscle size in shorter time.

Conclusion

With 5RD METHOD we noticed higher signals in desired muscle than other methods, in the last 2 repetitions we noticed a decrease in the frequency components of the EMG signal, typically represented by a fall in the center frequency (fc), and more decrease during biceps curl, during fatigue development muscle length significantly influences the EMG fc, and it may be an important factor to consider when utilizing the EMG fc to detect muscle fatigue also.