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ANALYSIS OF THE SUPPORT EFFECTIVENESS OF IBICI SEGRETA STOCKINGS AND PANTYHOSE – TESTED ON A SPECIMEN OF 2.500 WOMEN

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INTRODUCTION

Support hosiery is used in the prevention and therapy of venous disorder of the legs.

They are suitable in the prophylaxis and treatment of lymphatic or venous oedemas, of varicose veins, of venous thrombosis and of varicose and post phlebitic ulcer.

Obviously such a number of types of pathologies must be dealt with different appropriate degrees of compression, that each separate style should apply to the legs in order to achieve the maximum effectiveness.

The accurate choice of the right size is of the utmost importance. A mistake can frustrate the spotting of the right compression to be applied according to the pathology. It is necessary to keep in mind that the pression applied on each part of the leg corresponds to the tension of the fabric used, divided by the radius of the girth of the leg at that point. That means that the pression exercised by the hosiery is proportional to the leg dimension.

Manufacturers of various countries in the search of the optimal stocking, have been using with quite different methods to test the tension, that has caused lots of misunderstanding.

In many European nations, for instance, only support stockings and pantyhose controlled with Hoenstein or Empa method of measuring can be used in hospitals and prescribed by doctors. In Great Britain the British Standard entitle the use of support stockings and pantyhose with

compressive values measured with Hatra instruments, whereas in the U.S.A.. Kendal Company uses values obtained with Instron tester.

All these measurements are obtained by sophisticated means but do not consider the real shape of the leg that will wear the elastic garment.

There are instruments like the "Manometro Aneroide" by Dr. Sigg, the one of Borgnis, or the Oxford Pressure Monitor which allows to measure the pressure exercised by stockings and pantyhose on different part of the live legs. It consists of a thin sleeve to insert between the garment and limb.

Some electrodes are stamped inside the sleeve and an electronic pump pushes air into the sleeve; when pressure of the air blown into the sleeve is equal to the pressure exercised by the garment in the point having the lower pressure, the couple of electrodes gets separated, the electric circuit is cut, the pump stops, and the pressure reached in that point and in that moment is recorded and red by the operator; after that the pump gets active again by blowing air, the pressure increases and will drive away the electrodes and so on, up to the ones close to the malleolus.

It is to be said that using these instruments, attention must be used to where electrodes are placed; electrodes are not to be put on osseus parts because the results would not be reliable.

The instrument for test of pressure Hatra (Hosiery and Allied Trades Retail Association) is based on a model of limb (leg former) on which stockings and pantyhose are placed to be put into tension; an unit of measure is connected with the stockings or pantyhose during stretching and will read the relative tension on the desired parts; Hoenstein and Empa measure the tension of stockings and pantyhose not extended.

Values obtained are different because, generally, pressures taken with Empa and Hoenstein are higher than the ones obtained with Hatra, whereas Hatra is more close to measures registered on the live leg.

The following table shows the classification of drug tariff for medical prescription of support hosiery in the UK and the differences between Hatra and Hoenstein. (see fig. 1.)

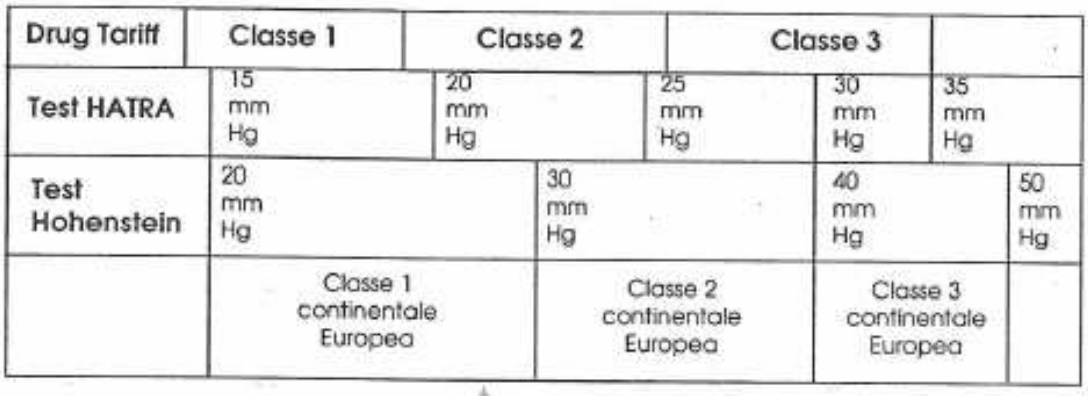


FIG. 1.

It is evident that Hoenstein measurements are higher in each class.

For the above mentioned reasons we prefer to avoid using any kind of classification, since we are firmly convinced that the only way to stay clear of mistakes is to refer only to the real value of pressure taken at the ankle.

In our opinion it is not correct to exclude from classification those stockings that lay below 15 mmHg of compression, since a compression of 7-10 mmHg is enough to control teleangeactasies, malleolus venous oedemas and ordinary varicose veins.

Further we have to point out that does not exist an exact reference value of compression that could apply to every single pathological problem. As a general rule we consider that the stocking should exert a pressure lower than the one we could theoretically expect when measuring the venous ankle pressure on patients suffering from superficial or deep venous insufficiency.

The orthostatic venous pressure at the ankle on healthy individuals should be approximately 25 mmHg, it can rise to 40 mmHg in the varicose syndrome, and reach 60 mmHg in the post-phlebitis syndrome.

Hosiery with pressure from 15 mmHg to 35 mmHg are efficacious when treating the above mentioned diseases, in particular when controlling oedemas and subjective symptoms; all the above according to the Laplace's law: (the compression applied on a single superficial vein, considering its small radius, will obviously be higher than the compression exerted on the

whole leg) thanks to the osmotic pressure of the plasmatic proteins of 25 mmHg, that will oppose to the liquid secrections from the venous vessels.

MATERIALS AND METHODS

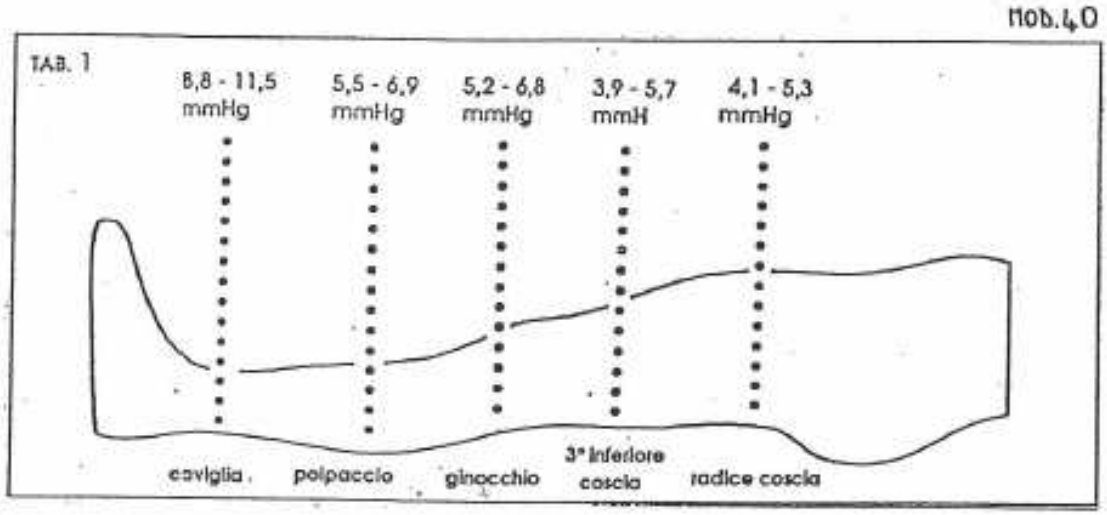
Taking into account what previously said, and on the basis of our previous publications on the prophylaxis and treatment of the legs venous insufficiency using hte support methodology, it is important to consider the following five specifications when prescribing a support stocking:

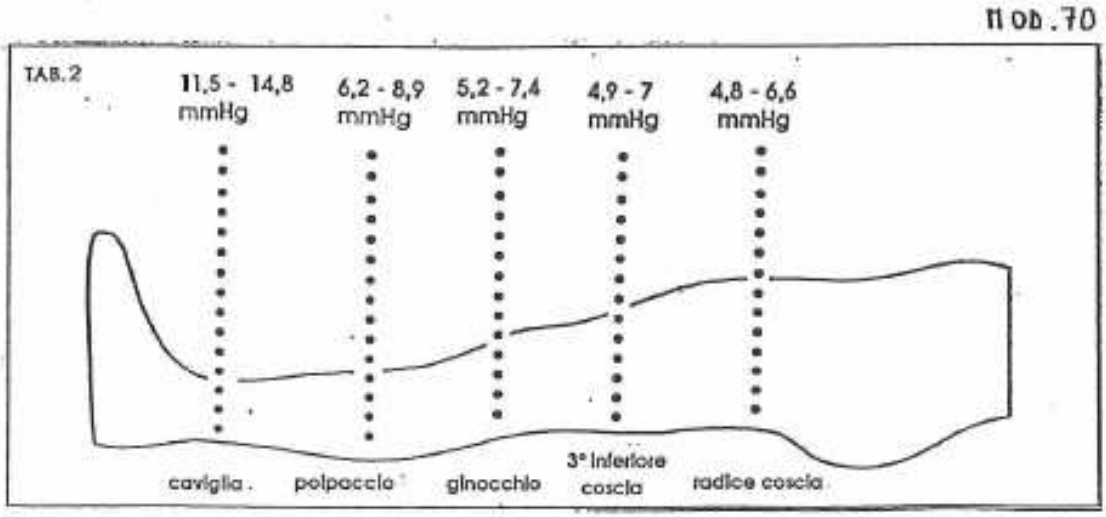
1) name of the product
2) its compression value
3) size
4) height
5) length

We deemed it necessary to test the products of the IBICI SEGRETA line, checking the data of the measurements of the real strength of compression for each single style and for each size on a specimen of 2.500 women aged between 18 and 75 years, between 150 cm. (59 inch) and 185 cm. (72 inch) of height, weight from 40 kg. (88 lbs) to 85 kg. (187 lbs).
We have considered the shoe size, the bimalleolus girth at the ankle, the one at the calf at its 3. medio, and at the root of the thigh passing through the back of the gluteal line and on the front at the basis of Scarpa's triangle.
We have always measured the height from the foot sole to the gluteal line.
The analysis of the anthropometrics results compared with the measures of our stockings enabled us to spot the right size for each single person.
After that, we inserted between the leg-form and the stocking a balloon of a manometer of the Borgnis type. We inflated air and read in progression the values obtained detaching the various electrodes from the more cranial to the more distal. For pantyhose five electrodes were put in correspondence of the medium retromalleolus dimple, of the 3. medium of the calf, of the knee, of the popliteus hollow, of the 3. inferior and superior of the thigh, always retro medial position.

When stockings were checked we did not consider, of course, the last two electrodes, while for the knee highs we used manometer with two only electrodes, at the malleolus and at the 3. medium of calf.

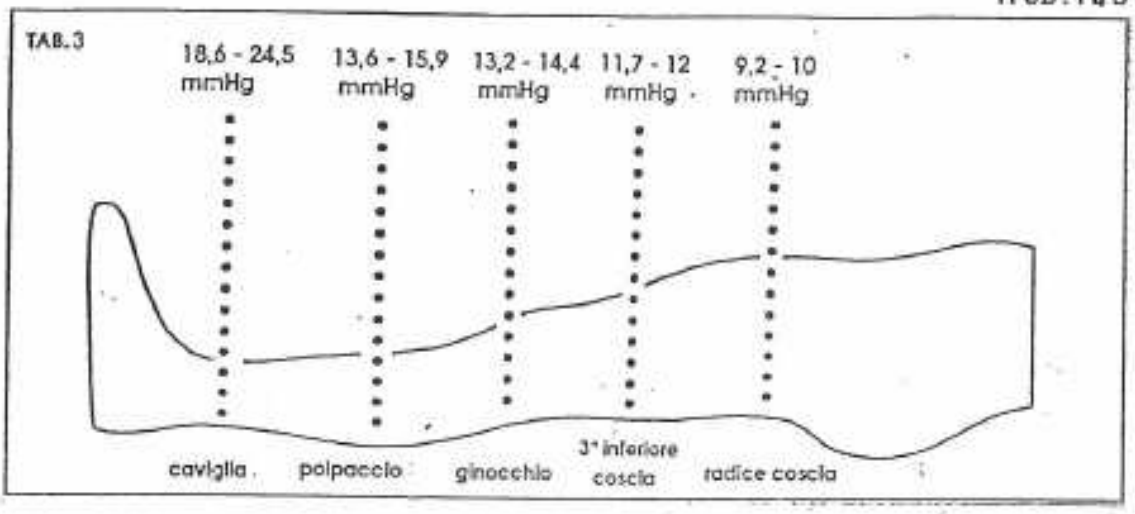
The following tables show the range of the pressure measurements. Each table is related to a different item. (see tables 1, 2, 3 and 4)





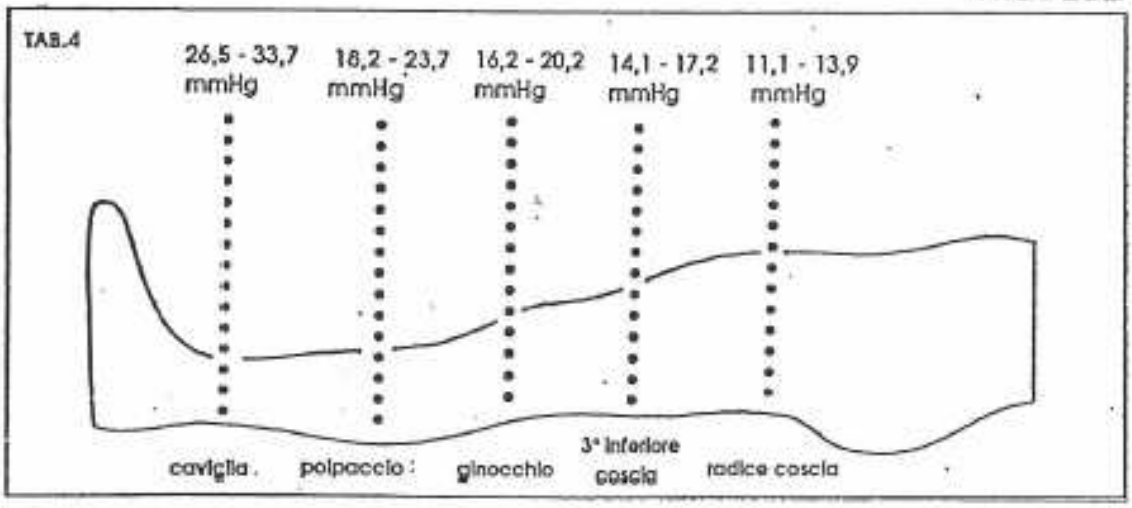
MOD. 140

TAB. 3



MOD. PLUS

TAB. 4



The foregoing values of compression are merely referred to the pantyhose, stockings and knee-highs of the IBICI SEGRETA support line.

The reading of this data points out a complex of tension values quite homogeneous in the various positions of the limb taken into consideration, in respect to the different types of product.

The few discrepancies are due to the methodology used of live leg measuring instead of the usual Leg Former.

We think that it is quite important to notice that every style, either the 40, 70, 140 or PLUS of the IBICI SEGRETA range, presents a clear decreasing compression trend, from the ankle to the thigh, in observance to those aerodynamic parameters where in presence of a compression 100% at the ankle should be 70% at the middle calf to lower to 40% at the thigh root.

Such a trend can surely guarantee a speed increase of the haematic flow when using the appropriate item, basic condition for a support stocking to be really therapeutic.

As a matter of fact it is the blood retention that causes all the pathologies of venous insufficiency, from the relaxation of venous walls to aedemas, to the valvular incontinence, to the dermo-epidemic degeneration phenomena and so on.

We speak of appropriate stocking even if, previously we said that does not exist a standard reference values of therapeutic compression. After considering how serious the aerodynamic illness is, we should increase in proportion the compression to apply to the ankle in order to achieve a higher haematic return speed, sufficient to oppose the retention of blood, resulting from the increase of the hydrostatic pressure, primary cause of the venous insufficiency.

We can therefore state that the SEGRETA 40 is useful where the lower limbs parestesies (heaviness and swelling symptoms) are the main cause of the venous insufficiency.

This product can also be used in the prophylaxis of hereditary predisposed patients, or for individuals at risk for particular habits of life, such as long standing or continuous sitting at work.

The SEGRETA 70 type still being suitable for the above mentioned problems, is efficacious in the treatment of teleangecstasy, and in the first stage of varices (0,5 cm), where a compression over 12 mmHg is considered sufficient to control venous oedema. This is most efficacious a prophilaxy during pregnancy with the MAMAN style, specially studied for this purpose.

The SEGRETA 140 type is properly prescribed for venous insufficiency with moderate oedemas and medium dimension varices (0,5 – 1 cm) and for medium varices during pregnancy (MAMAN 140 style).

The SEGRETA PLUS are therapeutic in the venous insufficiency presenting collaterals up to 1,5 cm, in the eczematous and ulcerous complications, in the post phlebitis syndrome as well as in presence of serious pregnancy varices. They are also properly used in the treatment of venous lymphatic oedema, of the post-traumatic one and even in the neoplastic not operable and cardio-congenital oedemas.

The prescription of the height depends on the type and duration of the pathology.

There are cases where the use of pantyhose is absolutely necessary: concomitance of vulvar varices during pregnancy, or in presence of teleangecstasy or saphenic oectasic collaterals at the 3rd superior of the thigh. They might also be prescribed for the other problems where the hemodynamic graduated compression is to be used for all previously mentioned reasons. In the pathologies involving only calf and ankle, stockings or knee-highs can be properly prescribed. Knee-highs are also used by male patients for obvious aesthetical reasons.

On the anthropometrical side we have recorded the following parameters of all the considered 2.500 women: weight, height, foot, girth at ankle, at calf and at the thigh root, length from the foot plant to the gluteal line.

The following table shows the correspondence of this data with the SEGRETA size range (see table 5)

TABLE 5

Taglia	Peso in Kg.	Altezza in cm.	Piede	Circonf. caviglia in cm.	Circonf. polpaccio in cm.	Circonf. linea glutea in cm.	Lunghezza dalla pianta del piede alla linea glutea
1°	41-59	150-162	36-38	17-20	28-38	FINO A 60	FINO A 76
2°	47-72	158-168	37-39	19-22	30-39	FINO A 62	FINO A 78
3°	52-74	165-174	38-40	20-24	31-40	FINO A 64	FINO A 80
4°	65-85	172-182	39-41	21-26	32-41	FINO A 66	FINO A 82
5°	OLTRE 76	OLTRE 180	OLTRE 41	OLTRE 26	OLTRE 41	OLTRE 66	OLTRE 82

CONCLUSIONS

We carried out a large scale test on a specimen of 2.500 women, taking only live pressare measurements, after individual anthropometrical recordings, in order to locate the type and size more suitable for each particolar need in the IBICI SEGRETA line.

We feel sure that the synthesis realised in the final table will enable the IBICI SEGRETA dealer to help the customers in the proper choice of the right garment.

We must always remind that the use of a medical product must respond to accurate and specific indications.

The support hosiery, in the sphere of venous pathology of lower limbs is similar to other therapeutic items.

Taking into account what previously said, we are aware that the live pressure measurement in such large number of patients, combined with the proper selection of size, leg after leg, is trustworthy in a scientifically indisputable way – we can therefore assert that the various IBICI SEGRETA styles, as analysed in detail in the previous chapter, exert a therapeutic compression that is considered efficacious according the classic canon laws of phlebologic clinical medicine.

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