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EVALUATION OF "INSTY" HERBAL GRANULES

ON THE DEVELOPMENT OF CHICK EMBRYO AND THE REPRODUCTIVE SYSTEM OF FEMALE WISTAR RATS

Insty herbal granules is a herbal medicine and popularly being used worldwide since 1997 against upper respiratory tract infections (URTIs). Present study was designed to evaluate Insty herbal granules in animal models to ensure its safe use against respiratory ailments by the pregnant women.



ABSTRACT

The present study describes the effect of Insty herbal granules on the development of chick embryo and reproductive system of female rats. Insty herbal granules did not produce any detectable teratogenic effects on 72 hours chick embryos. It was non-toxic in acute toxicity test at 1 and 5g/kg and also had no adverse effects on the estrous cycle pattern or on reproductive capacity parameters including fertility, gestation, live-born and weaning indices of female rats. Thus Insty herbal granules are safe as it neither displayed teratogenic or reproductive toxicities in chick embryo or female rats, respectively.

Keywords: "Insty" herbal granules, reproductive system, female rats, development, chick embryo, teratogen, toxicity, estrous cycle.

INTRODUCTION

"Insty" herbal granules is a herbal medicine and popularly being used worldwide since 1997 against upper respiratory tract infections (URTIs). It is a polyherbal mixture of eight therapeutic herbs: *Adhatoda vasica*, *Eucalyptus globulus*, *Foeniculum vulgare*, *Glycyrrhiza glabra*, *Salix alba*, *Thea sinensis*, *Valeriana officinalis* and *Viola odorata*.

Indeed, toxicological evaluation of herbal preparations is important in order to ascertain their safety for human consumption. There are various international regulatory and non-regulatory bodies such as Organization of Economic Cooperation Division (1983) and Eco-

bichon (1997), EEC (1992) and US EPA (1990) emphasizing on using a battery of in vivo and in vitro assays for supporting safety of herbal products.

Generally, medicinal herbs have been used to treat URTIs since ancient time and are still popular among people believing that they are safe and have no side effects. However, there are reports highlighting their toxic effects and hence requires precautions regarding their uncontrolled usage [1-4]. Medicinal plants induced adverse effects have been reported on the menstrual cycle and reproductive function of females as their excessive exposure, delays menstrual cycle, futile fecundity and hatching rates. Estrous cycle represents a series of reproductive events in female mammals except higher primates. During this cycle females are sexually receptive and ovulate spontaneously at defined intervals. Estrus (heat) is the time of ovulation corresponding to sexually provoked females. Cycling female rats have an estrous cycle of ~4 to 5 days [5] comprising 4 phases characterized as Proestrus, Estrus, Metestrus and Diestrus. These phases are characterized based on the proportion of three cell types (Nucleated epithelial cells, Anucleated cornified cells, and Leukocytes) which are observable in the vaginal smears. Any reproductive inefficiency is attributable to the prolonged estrus; thus, the female might need to be bred several times to enhance the chances of conception.

The teratogens are group of harmful substances that induce congenital malformations by inducing abnormalities during the embryonic growth in the differentiation process of developing organs. The malformations in-

clude intrauterine growth retardation, structural abnormalities and multiple congenital anomalies [6]. Chick embryo model is popularly used for the assessment of teratogenicity of wide range of compounds. [7,8]

The teratogenic and reproductive toxicity studies on Insty herbal granules polyherbal medicine have not been reported earlier. Therefore, present study was designed to evaluate Insty herbal granules in animal models to ensure its safe use against respiratory ailments by the pregnant women.

THE PURPOSE OF THE STUDY

The present study was designed to investigate the effects of Insty herbal granules on chick embryo growth and its development and on the reproductive system of female rats.

MATERIALS AND METHODS

The experiments were conducted at the Department of Physiology, University of Karachi, Pakistan and Herbio Pakistan (Pvt) Ltd. The Institutes of Health guide lines for the care and use of laboratory animals were followed (NIH Publications №8023, revised 1978).

Insty herbal granules. “Insty” herbal granules (Batch №2317053) was provided by the R & D section of Herbio Naturals dated 22nd September 2017. Its three different doses (0.9375 g, 1.12 g and 1.875 g) were constituted in physiological saline (0,1ml) to be administered in chick embryo. Likewise, Insty herbal granules (1 g/kg and 5 g/kg) were also prepared for oral administration to mice and rats.

Acute toxicity in mice. Animals were divided into control and treated groups (n=5 per sex). Mice were treated with Insty herbal granules orally using gastric gavage (1 and 5 g/kg) and observed for 14 days.

Developmental toxicity in chick embryo. Fertilized chick eggs (n=24), zero day old embryos and free from contagious chemicals and disease were purchased from local poultry farm. Each egg was disinfected with ethanol (70%) and randomly assigned into 4 groups (n = 6 fertilized eggs/group). The control group received isotonic saline (0,1 ml) and treated groups received three different doses of Insty herbal granules (0.9375 g, 1.12 g and 1.875 g). The saline or Insty herbal granules was administered in chorioallantoic membrane of chick embryo in the air-space present on the blunt end of egg and placed in an incubator (37° C) keeping the air-sac pointed upwards. Each egg was rotated and examined daily using candling to confirm the proper embryo growth and viability. After 72 hours of incubation, the egg shells were

Table 1 – Body weight of female Wistar rats before and after treatment with Insty granules

Insty granules, g			
Body weight	1 g/Kg	5 g/Kg	Control
Before treatment	175.25±5	165.25 ±4.6	171.2±5
After treatment	176.2±4.3	167.7±5.7	177.6±4.6

Note. Data are expressed as mean±S.E for control (n=10) and after treatment with Insty granule (n=12).

opened and albumen was aspirated carefully. From each egg, 72 hours developed embryo was separated and transferred into the Petri dish containing phosphate buffered saline and azide (PBS-Azide, pH=7.2) mixture and observed for abnormalities, if any.

Preparation of temporary slides of embryo. Each slide was labeled accordingly with a corresponding dose and embryo was placed onto a glass slide with the help of forceps and observed under stereomicroscope at 40x and photographed.

Reproductive toxicity in rats. Healthy female Wistar rats (n=34) *Rattus norvegicus* aged 4-5 months weighing between 140 to 200 g were purchased from the animal laboratory of Dow University of Health Sciences (DUHS), Karachi Pakistan. They were housed under standard environmental conditions (25° C±1° C and relative humidity 52-61%). All rats were accommodated in transparent polypropylene cages (45•25•15 cms) with laboratory grade bedding and maintained under standard colony photoperiodic conditions with a 12 hour light/dark cycle. All animals had free access to water and food.

Rats were randomly divided into 3 groups:

1. Control (n=10).
2. Groups.
3. End-product.

Received 1 g/kg or 5 g/kg of Insty herbal granules orally for 15 days (n=12 per group). All rats were weighed before and after Insty herbal granules solution administration and had free access to normal rat diet.

Determination of estrous cycle phase. The estrous cycle of each rat was monitored by colpocytological examination five days prior and subsequent to the dose administration. Vaginal smears were prepared at 10:00 am daily. The slides were stained using crystal violet stain (0.1%), analyzed microscopically (Nikon IT2, Japan) at 10x and 20x magnifications and photographed under illuminator. The differences in the estrous cycle stages were noted on the basis of cell types (Nucleated squamous epithelial cells, Anucleated cornified epithelial cells and Multi-lobed neutrophils) before and after Insty herbal granules administration. The presence and absence of these cell types and their relative proportion was noted and stages of the estrous cycle were also determined.

Breeding of untreated and treated female rats. After colpocytological examination of estrous cycle, females from each dose group (n=4) were mated with single randomly selected healthy male (4:1) until pregnancy occurred or two to three weeks have elapsed. Animals were separated after evidence of copulation as identified by the presence of sperms in the vaginal lavage. Near parturition, pregnant females were caged separately and allowed to deliver pups normally.

Assessment of reproductive indices of female rats. The reproductive capacity was determined monitoring five parameters such as:

1. Female fertility.
2. Gestation.
3. Live-born and.
3. Weaning indices.

These were calculated in the control and treated groups following FDA guidelines (Red book 2000).

RESULTS AND DISCUSSION

Many allopathic medicines are available against URTI such as antihistamines, antipyretics (paracetamol), anti-inflammatory agents (ibuprofen), cough suppressants (dextromethorphan), expectorants (guaifenesin) and decongestants (pseudoephedrine and phenylpropanolamine). However, they are associated with various side effects that may interfere with fetal development or affect the reproductive organs and hence not advisable to be used by pregnant women. Therefore, other options such as natural/herbal products which are efficacious, accessible, cost-effective and less toxic with minimum or no side effects are becoming popular as reflected by the prevalence of herbal use (22-82%) during pregnancy [4]. A polyherbal Insty herbal granules preparation is an effective formulation against URTI. Each of the plant was carefully selected owing to multiple pharmacological properties which are accountable for their inclusion

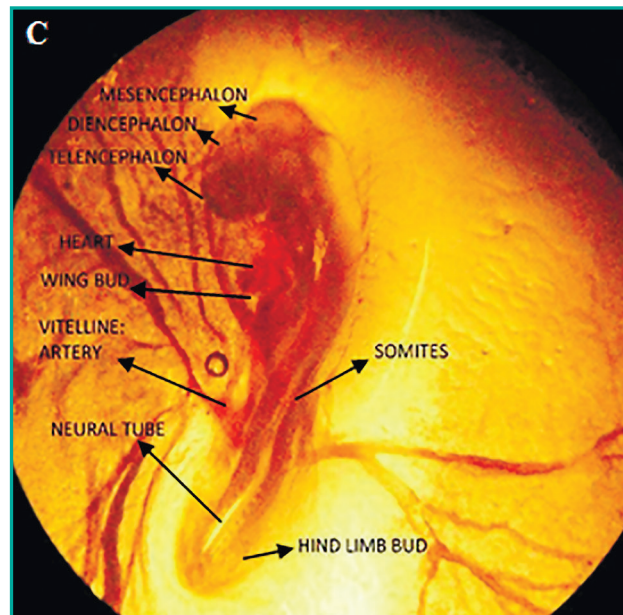
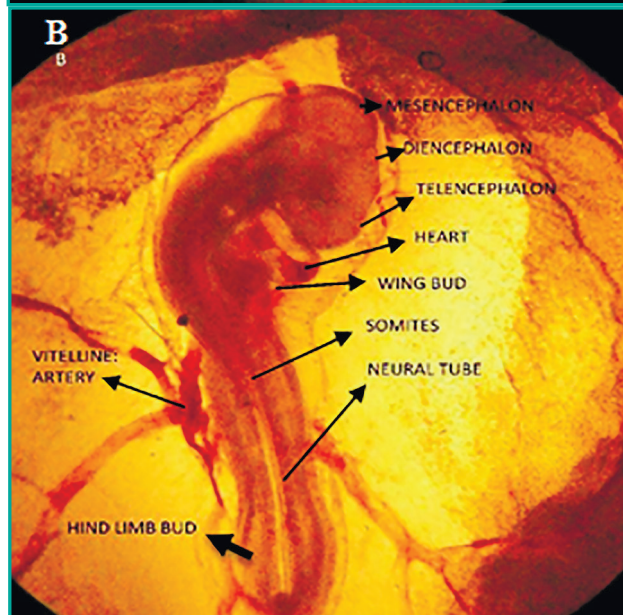
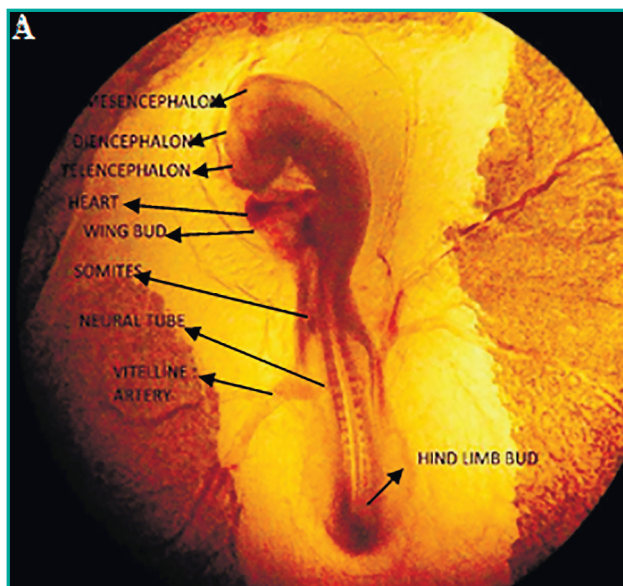
in "Insty" herbal granules preparation. It also rationalizes their action against respiratory diseases due to their bronchodilatory, anti-tussive, expectorant, anti-inflammatory, anti-microbial, anti-allergic, anti-asthmatic and anti-oxidant properties. [9]

The "Insty" herbal granules did not cause any sign of ill health in mice at 1 and 5 g/kg. The heart and respiratory rate, writhing, stretching and fecal abnormality, behavioral changes were normal with no mortality. Therefore, the ED₅₀ could not be calculated which supports that it is non-toxic. The body weights amongst all the animal groups were also similar before and after treatment with Insty herbal granules (Table 1). Thus indicating Insty herbal granules ingestion for a period of fifteen days did not perturb the food-intake which was not only palatable but also without any undesirable effects on physiology and/or biochemistry of the digestive system.

In our study, chick embryo development was normal in the presence of three doses of Insty herbal granules without any observable malformations and comparable to control group (Figure 1). The amniotic fluid remained normal in all treated groups. Various developing organs including brain (Mesencephalon, diencephalon, telencephalon), heart, wing bud, hind limb bud, blood vessels, somite and neural tube developed normally in control and treated embryos. For the sake of clarity, the features were also compared with the reference figure of 72 h chick (Figure 1).

Moreover, there was no embryo mortality in the presence of Insty herbal granules doses tested (Table 2) and consequently it is neither embryo toxic or teratogenic. Conversely, those chemicals which are teratogenic such as caffeine, diazepam, phenytoin, and local anesthetics cause defective neural tube development in chick embryos. [10]

Our results also revealed that there were no differences in the duration of proestrus, estrus, metestrus and diestrus phases ($P > 0.05$) or any detectable changes in the various stages of estrous cycle (Table 3, Figure 2).



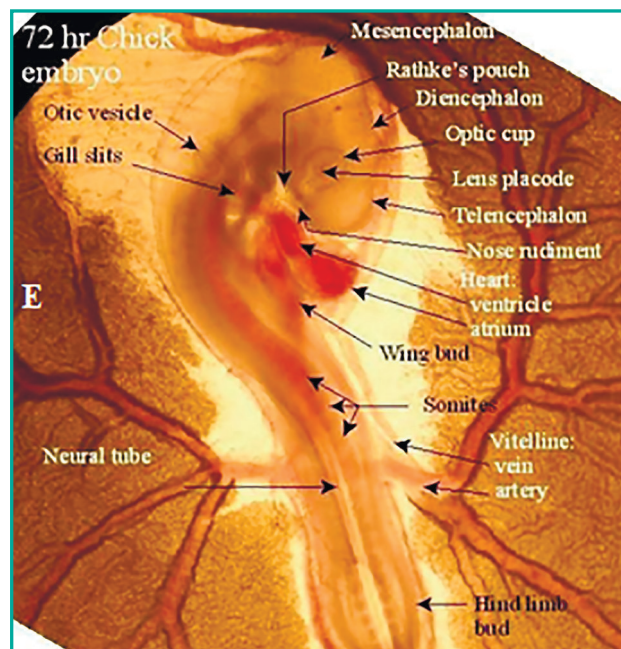
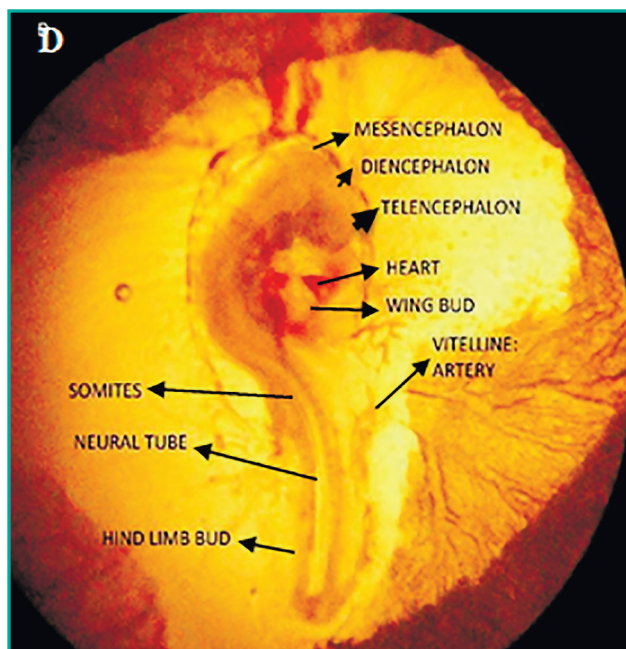


Figure 1 – Development of 72 hours chick embryo in the presence and absence of different doses of Insty
Notes. A – Control inoculated with saline and with different doses of Insty, B – 0.9735 g, C – 1.12 g, D – 1.875 g, E – Reference 72 hours chick embryo.

ESTROUS CYCLE PHASES	BEFORE INSTY ADMINISTRATION	AFTER INSTY ADMINISTRATION (1g/Kg and 5g /Kg)	REFERENCE FIGURE
Proestrus (A and E)	Epithelial cell	Epithelial cell	Epithelial cell
Estrus (B and F)	Cornified cell	Cornified cell	Cornified cell
Metestrus (C and G)	Epithelial cells Leucocyte	Leucocyte	Epithelial cells Leucocyte
Diestrus (D and H)	Leucocyte	Leucocyte	Leucocyte

Figure 2 – Vaginal smear slides before and after Insty administration in Wistar rats

Notes:

1. Various estrous cycle phases in female rats: Before (Control): A-E – Proestrus, B, F – Estrus, C, G – Metestrus, D, H – Diestrus and after Insty (1 g/Kg and 5 g/Kg). Administration (Treated): E – Proestrus (F), G – Estrus, H – Metestrus and Diestrus.
2. All the slides were observed at 10x magnification. The cells identified and marked as: *Cornified cells, Epithelial cells and Leucocytes.*
3. All the slides were observed at 10x magnification. The cells identified and marked as: *Cornified cells, Epithelial cells and Leucocytes.*
4. The observation were compared and confirmed with research publication. [11]

These findings are indicative that “Insty” herbal granules has no undesirable effects on the aforementioned Parameters.

Various reproductive indices including female fertility, gestation, live born and weaning were assessed revealing 100% index value in both control and “Insty” herbal granules treated groups (Table 4).

These results signify that herbal preparation is balanced, safe and without any unpleasant effect on the rat fertility. All pregnant rats delivered their pups normally with no evidence of prematurity or abortion suggesting that the Insty herbal granules herbal granules when consumed

Table 2 – Development of structures in 72hrs embryo receiving various doses of Insty

Groups				
Developing Structures	1	2	3	4
Brain structures	+	+	+	+
Heart	+	+	+	+
Blood vessels	+	+	+	+
Somite	+	+	+	+
Neural tube	+	+	+	+
Dead embryo	0	0	0	0
Mortality				

Note. Normal embryo development (+), no mortality (0).

Table 3 – Duration of phases of Estrous cycle in control and Insty treated Wistar female rats

Phases of estrous cycle	Duration in days of estrous cycle phases				Control	Estrous cycle duration
	Insty treated groups					
	1 g/Kg		5 g/Kg			DAYS
	Pre treated	Post treated	Pre treated	Post treated		
Proestrus	0.6±0.07	1±0	0.6 ±0.06	1±0.14	0.56±0.06	1-2
Estrus	0.56±0.05	1.4±0.2	0.6 ± 0.06	1±0.14	0.75±0.2	1-2
Metestrus	1.5±0.2	2±0.3	1.9 ± 0.16	2 ±0.3	1.65±0.3	1-2
Diestrus	1.94±0.2	2±0.3	1.45±0.2	1.5±0.7	1.5±0.2	2-3

Notes. Rats received saline (Control) or Insty (1 g/Kg and 5 g/Kg). Different phases of estrous (Proestrus, estrus, metetrus and diestrus) were identified microscopically before and after treatment. Data is expressed as mean±S.E. (Days). Results were compared to the research publication. [12]

orally do not act as an abortifacient at the concentration used. Furthermore, no detectable changes in the maternal body weight, number of implantations, litter size, and pup body weights were observed. Likewise, no differences in live birth index, pup viability index and percentage of post implantation death were noticeable. These findings led us to suggest that Insty herbal granules at given doses and balanced formulation during 15 days of oral treatment in rats is safe. However, it requires further animal investigations regarding its effect on reproductive hormonal levels which may further support the present findings.

CONCLUSION

It is concluded that Insty herbal granules herbal granules at applied doses is safe and does not induce any teratogenic effects on 72 hours chick embryo. The oral administration of Insty herbal granules herbal granules for a period of 15 days at applied doses are also safe and did not distort the estrous cycle pattern of female rats. It has no detectable adverse effect on the body weight and reproductive cycle. Thus it may be extrapolated that it is most likely free of any undesirable effect on the human female reproductive cycle and can be used against respiratory ailments in both young reproductive aged (non-pregnant) as well as pregnant females.

РЕЗЮМЕ

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ВЛИЯНИЕ РАСТИТЕЛЬНЫХ ГРАНУЛ НА РАЗВИТИЕ ЭМБРИОНОВ ЦЫПЛЯТ

Table 4 – Effect of Insty granules on reproductive indices of female Wistar rats

№	Reproductive indices	Control	Insty granules	
			1 g/kg	5 g/kg
1	Female fertility index	100	100	100
2	Gestation index	100	100	100
3	Live born index	100	100	100
4	Weaning index	100	100	100

Note. All values are represented as percentage of indices in both control and Insty treated groups.

И РЕПРОДУКТИВНОЙ СИСТЕМЫ САМОК КРЫС ВИСТАР

Проведено исследование с целью определения степени влияния растительных гранул «Инсти» на развитие эмбрионов цыплят и репродуктивную систему самок крыс. Отмечено отсутствие тератогенного воздействия РЛС в течение 72 часов на эмбрионы цыплят. Растительные гранулы являются нетоксичными (в количестве 1 и 5 г/кг), не оказывают вредного воздействия на структуру эстрального цикла или параметры репродуктивной способности, включая показатели фертильности, беременности, живорождения и оттока самок крыс.

В ходе исследования нами доказано, что травяные гранулы «Инсти» безопасны в применении, так как в ходе эксперимента не было выявлено тератогенной или репродуктивной токсичности у эмбриональных цыплят или самок крыс вистар соответственно.

Ключевые слова: растительные гранулы «Инсти», РЛС, растительное лекарственное средство, репродуктивная система, самки крыс вистар, эмбрионы цыплят, тератогенность, токсичность, эстральный цикл, беременность.

References:

1. Use of a standardized extract from *Echinacea angustifolia* (Polinacea) for the prevention of respiratory tract infections. / F. Di Pierro, G. Rapacioli, T. Ferrara, S. Togni. – *Altern Med Rev.* – 2012. – №17(1). – P. 36-41.
2. Ikuta K., Mizuta K., Suzutani T. Anti-influenza virus activity of two extracts of the blackcurrant (*Ribes nigrum* L.) from New Zealand and Poland. – *Fukushima J Med Sci.* – 2013. – №59(1). – P. 35-38.
3. Nantz M.P., Rowe C.A., Muller C., Creasy, Colee J., Khoo C., Percival S.S. Consumption of cranberry polyphenols enhances human gammadelta-T cell proliferation and reduces the number of symptoms associated with colds and influenza: a randomized, placebo-controlled intervention study. – *Nutr J.* – 2013. – №12. – P. 161. Doi: 10.1186/1475-2891-12-161.
4. John L.J., Shantakumari N. Herbal medicines use during pregnancy: A review from the Middle east. – *Oman Medical Journal.* – 2015. – №30(4). – P. 229-236.
5. Marcondes F.K., Miguel K.J., Melo L.L., Spadari-Bratfisch R.C. Estrous cycle influences the response of female rats in the elevated plus-maze test. – *Physiology & Behavior.* – 2001. – №74(4). – P. 435-440. Doi: [https://doi.org/10.1016/S0031-9384\(01\)00593-5](https://doi.org/10.1016/S0031-9384(01)00593-5).
6. Gilbert-Barness E. Teratogenic Causes of Malformations. – *Annals of Clinical & Laboratory Science.* – 2010. – №40(2). – P. 99-114.
7. Bokariya P., Kothari R., Gujar V.K., Shende M.R. Teratogenic effects of insulin: An experimental study on developing chick embryo. – *Indian Journal of Pharmacology.* – 2015. – №47(2). – P. 212-214. Doi: 10.4103/0253-7613.153433.
8. Elumalai G., Chodisetty S. Teratological Effects of High Dose Progesterone on Neural Tube Development in Chick Embryos. – *Elixir Gynaecology.* – 2016. – №97. – P. 42085-42089.
9. Claeson U.P., Malmfors T., Wikman G., Bruhn J. G. *Adhatoda vasica*: A critical review of ethnopharmacological and toxicological data. – *Academic Journals.* – 2000. – №72(1-2). – P. 1-20.
10. Guney O., Canbilen A., Konak A., Acar O. The effects of folic acid in the prevention of neural tube development defects caused by phenytoin in early chick embryos. – *Spine (Phila Pa 1976).* – 2003. – №28(5). – P. 442-445. Doi: 10.1097/01.brs.0000048647.17577.13.
11. Cora M., Kooistra I., Travlos G. Vaginal cytology of the laboratory rat and mouse: review and criteria for the staging of the estrous cycle using stained vaginal smears. – *Toxicologic Pathology.* – 2015. – №43. – P. 776-793.
12. Parkes A.S. The length of the oestrous cycle in the unmated normal mouse: Records of one thousand cycles. – *J Exp Biol.* – 1928. – №5. – P. 371-377.

НОВОСТИ ЗДРАВООХРАНЕНИЯ И ФАРМАЦИИ

Бойкот в Южной Корее: японские RX держат удар, а ОТС пропадут из аптек

Решение правительства Японии об ограничении поставок ряда химических веществ и комплекствующих побудило корейских потребителей бойкотировать все японские товары. Быстро стал вирусным хэштэг #boycottJapan, призывающий пользователей к бойкоту всего, что связано с Японией: от отмены поездок в эту страну до отказа от потребительских товаров. Флешмоб вызвал обеспокоенность у известных японских компаний, работающих в Корее. Корейские филиалы японских фармацевтических компаний с тревогой наблюдают за эскалацией ситуации, опасаясь возможного бойкота их продукции.

В настоящее время японские фармкомпании активно развернулись в Корее. По данным Корейской ассоциации фармацевтических трейдеров, общая стоимость лекарственных препаратов, включая косметические средства, импортированных из Японии в прошлом году, составила \$927,96 млн. Это второй по величине после США показатель (\$1,3 млрд).

На данный момент кажется маловероятным, что бойкот повлияет на положение японских фармацевтических компаний, сфокусированных на этическом продвижении продукции, то есть лекарств, доступных только по письменным рецептам врача или фармацевта. В случае замены таких лекарств другими приходится учитывать много нюансов, таких как отсутствие аналогов и покрытие страховкой. Поэтому корейцам практически невозможно не использовать лекарства, производимые японскими фармацевтическими компаниями.

Многие из японских ЛП буквально оккупировали рынок. Например, донепезил, производимый японской Eisai, занимает более 90 % внутреннего рынка лекарственных средств для лечения деменции. Эти японские фармпроизводители вряд ли пострадают негодования корейских потребителей.

В то же время бойкот может повлиять на поставку и продажи безрецептурных лекарств, таких как поливитамины и для лечения ЖКТ. Некоторые из местных фармацевтов уже опубликовали в социальных сетях заявления о том, что они изъяли из ассортимента японские безрецептурные препараты. «Я убрал с полки SABAGIN KOWA α, препарат, выпускаемый компанией Kowa, и Actinum, мультивитамин, производимый Takeda Pharmaceutical», – написал один местный аптекарь.

Некоторые фармацевты также начали выкладывать на YouTube видеоролики о безрецептурных препаратах, выпускаемых японскими компаниями, рекомендуя заменять их аналогичными продуктами от корейских производителей.

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